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23 February 1977

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CHEMISTRY

No. 52

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23 February 1977

## USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS

### CHEMISTRY

No. 52

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## Adsorption

USSR

UDC 541.183

### ENERGETIC MANIFESTATION OF THE SPECIFICS OF ADSORPTION IN CARBON ADSORBENT MICROPORES

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA KHMICHESKAYA in Russian No. 9, Sep 76 pp 1929-1934 manuscript received 14 Aug 75

BABAYEV, P.I., DUBININ, M.M., ISIRIKYAN, A.A., Institute of Physical Chemistry, Acad. Sci. USSR, Moscow

[Abstract] A detailed study is performed of the adsorption isotherms and differential heats of adsorption of benzene on microporous and nonporous carbon adsorbents of identical chemical nature. The primary distinguishing feature of adsorption in micropores is the significant increase in heat of adsorption of vapors in comparison with a nonporous adsorbent of the same nature, which for carbon adsorbents and benzene amounts to about 4 kcal/mol throughout almost the entire area of filling. A comparison of calorimetric heats of adsorption at 25 C and adsorption isotherms at 100 C allows the adsorption isotherm of benzene on type AS carbon to be produced by means of the isosteric ratio at 25 C over a broad range of filling and relative pressures for the first time. A range of change of  $p/p_s$  of 7 orders of magnitude is achieved for benzene at 25 C, allowing determination of the full thermodynamic characteristics of this system. 9 references.

USSR

UDC 541.183

### A NEW TYPE OF ADSORBENT CONTAINING SH GROUPS

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA KHMICHESKAYA in Russian No. 9, Sep 76 pp 2113-2115 manuscript received 10 Feb 76

NEDOSPASOV, A.A., KHOMUTOV, R.M., Institute of Molecular Biology, Acad. Sci. USSR, Moscow

[Abstract] Modification of aminoxy adsorbents is used to produce a new type of sorbent containing SH groups. The sorbents produced are used for covalent immobilization of biologically active compounds, forming C-S, C-Hg-S and S-S bonds. The reversibility of the immobilization, achieved by treatment of the sorbent with a thiol solution, and the possibility of demercuration to produce the initial nucleotides, make the method particularly valuable for the performance of present-day tasks in molecular biology. 10 references.

Aerosols

USSR

UDC 66.069.8

ELECTROHYDRODYNAMIC ATOMIZATION OF LIQUIDS

Moscow USPEKHI KHMII in Russian Vol 45, No 12, 1976 pp 2274-2284

KOZHENKOV, V. I. and RUKS, N. A., Scientific-Research Physicochemical Institute imeni L. Ya. Karpov, Moscow

[Abstract] The method of electrohydrodynamic atomization of liquids (EHDAL) of monomeric unipolarly charged aerosols is possible for a large number of substances, including solutions of organic and inorganic materials, volatile and nonvolatile liquids, suspensions and even melts, has a very wide range of application. Its use is even now being suggested for such areas as colloidal rocket engines, microcapsulization, microdosing of highly toxic and poisonous substances, the preparation of emulsions, and the demonstration of electrophysical tests; and also in combination with hydraulic and disk atomization, as well as in electric dyeing. Particularly promising areas for the use of EHDAL are as follows: 1) the preparation of fine, very homogeneous coatings from solutions of polymers, oligomers and some salts and electrolytes; 2) the calibration of aspiration counters and ion spectrometers, and other similar equipment; and 3) the preparation and study of individual polymeric molecules by the method of high-dispersion monodispersion atomization of very weak polymer solutions.

Luminescence

USSR

UDC 661.143

A SIMPLE CRYOSTAT FOR OPTICAL AND ELECTRIC STUDIES OF CRYSTALS

MONOKRISTALLY I TEKHNIKA [MONOCRYSTALS AND TECHNOLOGY -- COLLECTION OF WORKS]  
in Russian No 13 Khar'kov, 1976 pp 145-147

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 22 (II) 1976 Abstract No. 22L142 from  
the resume]

VAKULENKO, V. Ya., ANDRYUSHCHENKO, A. V., KRIVONOSOV, Ye. V., GAYCHISH, V. A.

[Text] A description is presented of a dismountable metal cryostat designed  
for studies of the photo- and radioluminescence of alkali halide crystals at  
liquid nitrogen temperature. The cryostat allows the study of absorption at  
low (80 K) and high (473 K) temperatures, thermoluminescence and thermostimulated  
currents in crystals, as well as application of an electric field to the  
specimen during the performance of investigations.

USSR

UDC 661.143:546.284(088.8)

METHOD FOR PREPARATION OF SILICATE LUMINOPHORES

USSR AUTHOR'S CERTIFICATE No 353579, FILED 13/04/73, PUBLISHED 15/01/76 in  
Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No 21, 1976 Abstract No 21L202P by N. Sh.]

KORABLEV, N. M., ZHITINSKIY, A. V., CHLENOV, V. A. and MIKHAYLOV, N. V.

[Text] Silicate luminescent compositions are obtained by calcination of a  
silicon-containing batch in the presence of an activator. To increase the  
brightness of luminescence and to simplify the process, aerosil is used--  
a product of  $TiCl_4$  hydrolysis in hydrogen flame--as the silicon-containing  
component. Example. A mixture consisting of zinc oxide 13.4, aerosil 5.2 g,  
manganese carbonate 0.6 g is mixed thoroughly and then calcined in a crucible  
at 1250°C for one hour in a tubular kiln equipped with silite heaters; next,  
the material is cooled, transferred to a mortar, ground, washed with  
demineralized water, dried at 150-200°C and passed through a No 64 mesh siev.

Organophosphorus Compounds

USSR

UDC 547.241

THE INTERACTION OF METHYLTHIONOPHOSPHINE SULFIDE WITH 1,1-DIHYDROPERFLUORO-ALKYL ALCOHOLS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76 p 2389  
manuscript received 28 Feb 76

LEBEDEV, V.N., TABASARANSKAYA, T.Z., Moscow Institute of the Petrochemical and Gas Industry

[Abstract] Methylthionophosphine sulfide (I) reacts with aliphatic alcohols to form dithiophosphonic acids. The reaction of I phosphine with 1,1-dihydroperfluoroalkyl alcohols results in the formation of earlier unknown methyl-0-(1,1-dihydroperfluoroalkyl)thiophosphonic acids, colorless viscous liquids soluble in hexane, benzene and ether. 2 references.

USSR

UDC 547.241+547.233

THE PRODUCTION OF ASYMMETRICAL PHOSPHORYLATED AMINOACETALES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76 pp 2389-2390  
manuscript received 4 Feb 76

MINBAYEV, B.U., AYMAKOV, O.A., KABDULOVA, U.B., Chemical-Metallurgical Institute, Acad. Sci. Kazakh SSR

[Abstract] The authors show that asymmetrical phosphorylated aminoacetals can be easily produced by interacting dialkyl esters of oxymethylphosphonic acid with monoathenolamine vinyl ether at room temperature, the yield of the products being 70-82%.

USSR

UDC 547.26'118+547.379.1

INTERACTION OF O,O-DIETHYL-N-DIETHYLAMIDOPHOSPHITE WITH ETHYLTHIOACETALENE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76 pp 2390-2391  
manuscript received 13 Feb 76

PETROV, M.L., SALISHCHEV, V.G., PETROV, A.A., Leningrad Technological Institute imeni Lensovet

[Abstract] Continuing the study of the reactions of attachment of organic compounds of trivalent phosphorus, the authors investigated the interaction

of 0,0-diethyl-N-dimethylamidophosphite with ethylthioacetylene. It was found that if the ethylthioacetylene was treated with an equivalent quantity of 0,0-diethyl-N-dimethylamidophosphite in absolute ethyl alcohol, trans-2-ethylthiovinylidethylphosphonate and trans-2-dimethylamino-2-ethylthioethylene are formed in equimolecular quantities. 2 references.

USSR

UDC 547.419.1

SYNTHESIS OF C-PHOSPHORYLATED ESTERS OF CARBOXYLIC ACIDS BY MEANS OF REFORMATSKIY REAGENT

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76 pp 2391-2392 manuscript received 19 Feb 76

MALENKO, D.M., GOLOLOBOV, Yu.G., Institute of Organic Chemistry, Acad. Sci. UkrSSR

[Abstract] A method is developed for production of C-phosphorylated carboxylic acid esters such as carbalkoxyalkylphosphonites with yields of 30-50% using easily available zinc-organic derivatives of  $\alpha$ -bromocarboxylic acids -- Reformatskiy reagent. 5 references.

USSR

UDC 542.241+547.384

KETOVINYLLATION OF SALTS OF DIALKYL(ARYL)DITHIOPHOSPHORIC ACIDS

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76 p 2392 manuscript received 20 Feb 76

BEYSHEKEYEV, Zh., DZHUNDUBAYEV, K.D., TOKTOVEKOVA, T., DZHORUPBEKOVA, Zh., Institute of Organic Chemistry, Kirgiz SSR

[Abstract] This work is dedicated to the synthesis and study of the properties of the products of the interaction of phenyl  $\beta$ -ketovinylchlorides with various potassium salts of dialkyl(aryl)dithiophosphoric acids. The reaction is conducted in anhydrous acetone at room temperature, is energetic and exothermic and is then completed with heating in 6-8 hr. The products are separated by precipitating potassium chloride, removing the acetone, dissolving the residue in benzene, washing with water, distilling off the benzene in a vacuum, producing yields of 70-95%. The 0,0-dialkyl(aryl)-S-( $\beta$ -phenylketovinyl)dithiophosphates vary from transparent to light brown in color, are soluble in many organic solvents but insoluble in water. 3 references.

USSR

UDC 541.49+538.221

ELECTROCONDUCTIVITY OF COMPLEXES OF TEN TETRAHALIDES WITH ORGANOPHOSPHORUS COMPOUNDS

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76 pp 2392-2393 manuscript received 30 Mar 76

BASHKIROV, Sh.Sh., KURAMSHIN, I.Ya., PARFENOV, V.V., KHRAMOV, A.S., Kazan' State University

[Abstract] Measurements are presented of the resistivity of the complexes  $[R_2R'P(Y)]_2SnX_4$ , which had never before been studied. The values of  $\rho$  for these compounds lie between  $10^{14}$  and  $10^{15}$  ohm•cm, making them organic semiconductors. 3 references.

USSR

UDC 547.77+661.718.1

3,5-DIPHOSPHORYLATED 1,2,4-TRIAZOLES

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76 pp 2393-2394 manuscript received 21 Apr 76

SHISHKIN, V.Ye., ZOTOV, Yu.L., NO, B.I., Volgograd Polytechnical Institute

[Abstract] Continuing the study of the reactions of phosphorylated imino esters with nitrogen bases, the authors studied the reaction of organophosphorus imino esters with hydrazene under mild conditions, resulting in the formation of 3,5-diphosphorylated 1,2,4-triazoles with high yield. The reaction was conducted by heating the mixture of reagents (slight excess hydrazene) in a water bath for 4-6 hr at 80 C.

USSR

UDC 547.26'118

INTERACTION OF HYPOPHOSPHITES WITH p-BENZOQUINONE

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76 pp 2394-2395 manuscript received 22 Apr 76

YUDELEVICH, V.I., SOKOLOV, L.B., IONIN, B.I., Leningrad All-Union Research and Technological Institute for Antibiotics and Medical Enzymes; Leningrad Technological Institute imeni Lensoveta

[Abstract] When 50% aqueous hypophosphorus acid interacts with p-benzoquinone, the latter is reduced to form quinohydron and hydroquinone. Studying the

reactivity of hypophosphites, the authors discovered that this reaction, when conducted in an anhydrous medium or with sparse water present, also leads to the formation of attachment products -- p-oxyphenyl esters of phosphorus acid. 3 references.

USSR

UDC 547.26'118

REACTION OF S-ALKYLTHIOPHORIC ACID DICHLORIDES WITH 1,1-DIMETHYLHYDRAZENE

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76 p 2395  
manuscript received 16 Mar 76

USKACH, Ya.L., MANDEL'BAUM, Ya.A., BAKANOVA, Z.M., DYMOVA, S.F., SUPIN, G.S., TRENTOVSKAYA, L.K., All-Union Scientific Research Institute for Chemical Plant Protection Substances

[Abstract] The authors succeeded in producing S-alkyl-1,1-dimethylhydrazido-thiophosphoric acids from the reaction mixture produced by interaction of S-alkyldichlorothiophosphates with 1,1-dimethylhydrazene in methylene chloride at 10-40 C with a yield of 26-40%. The compounds produced have unusual acid-base properties. Their basic properties are very slight, their acidic properties are also slight. The  $pK_a$  values differ from the corresponding values of hydrazidothiophosphates and phosphoric and thiophosphoric acid ester amides. These properties indicate that these compounds exist in the form of a bipolar ion. 3 references.

USSR

UDC 541.63:547.1'118

THE THREE DIMENSIONAL STRUCTURE OF TRIALKYLPHOSPHATES

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA KHIMICHESKAYA in Russian No. 9, Sep 76 pp 2013-2017 manuscript received 16 Jul 75

RAYEVSKIY, O.A., VERESHCHAGIN, A.N., DONSKAYA, Yu.A., ABUL'KHANOV, A.G., LEVIN, Ya.A., Institute of Organic and Physical Chemistry, Kazan' Affiliate of Acad. Sci. USSR

[Abstract] The stereochemistry of trialkylphosphates is discussed in relation to the influence of the branched hydrocarbon substituent. The IR spectra and DM are studied for  $(RO)_3PO$ , where  $R=CH_3$  (I),  $C_2H_5$  (II),  $C_3H_7$  (III),  $C_4H_9$  (IV),  $i-C_3H_7$  (V),  $t-C_4H_9$  (VI). Information on the Kerr effect is also presented for VI. In the trialkylphosphates tested (excluding tri(tert.butyl)phosphate), thermodynamic equilibrium of conformers is achieved. The conformer with the cis or gauche placement of all OR groups relative to the P=O bond predominates. In tri(tert.butyl)phosphate, the gauche-gauche-gauche conformer is stabilized. An increase in the volume of R leads to extraction of the form with the trans orientation of one of the OR groups from the conformation equilibrium. 21 references.

USSR

UDC 547.26'118

ESTERS OF ALKOXY(DIHALOGENPHOSPHONYL)ACETIC ACID

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76 pp 2387-2388 manuscript received 12 Jan 76

KOZHUSHKO, B.N., PALIYCHUK, Yu.A., SHOKOL, V.A., Institute of Organic Chemistry, Acad. Sci. UkrSSR

[Abstract] Continuing the study of the interaction of esters of alkoxyhalogenacetic acids with dialkylhalogenphosphites, the authors establish that esters of alkoxyhalogenacetic acid also react easily with alkylidihalogenphosphites in the presence of catalytic quantities of anhydrous ferrous chloride with the formation of alkoxy(dihalogenphosphonyl)acetic acid esters. The esters produced are pure, the yield is high. Alkoxy(dihalogenphosphonyl)-acetic acid esters are easily hydrolyzable, colorless liquids, easily soluble in most inert organic solvents.

USSR

UDC 547.26'118

HEXAALKYLENOXYCYCLOTIPHOSPHAZENES

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76 p 2388 manuscript received 12 Jan 76

BRANDT, K., KIREYEV, V.V., KORSHAK, V.V., Moscow Institute of Chemical Technology

[Abstract] A detailed study of the reaction between hexachlorocyclotriphosphazene and monoalcoholates of glycols in tetrahydrofuran shows that it is more complex than earlier thought. The products of the reaction of hexachlorocyclotriphosphazene with 1,4-butanediol, diethyleneglycol and 1,6-hexanediol monoalcoholates are viscous, light yellow substances, similar in composition to those described earlier, but the separation of these products by multistage liquid chromatography on cellulose and silica gel with NMR testing of the fractions has shown that the substances formed also contain significant quantities of compounds with spirocyclic fragments, oligomers, products of partial hydrolysis, dehydration and incomplete substitution. Some of the characteristics of the individual compounds isolated are presented.

USSR

UDC 547.241

THE REACTION OF DIETHYLPHENYLPHOSPHITE WITH 1-NITRO-1-PROPENE

Leningrad ZHURNAL OБSHCHEY KHMII in Russian Vol. 44 No. 10, Oct 76 pp 2385-2386 manuscript received 24 Feb 76

GAREYEV, R.D., LOGINOVА, G.M., ABUL'KHANOV, A.G., PUDOVIK, A.N., Kazan' State University

[Abstract] A study is made of the reaction of diethylphenylphosphite with 1-nitro-1-propene. GLC and NMR are used to establish that in addition to 0-ethyl-0-phenylisopropenylphosphonate (I) and diethylphenylphosphite (II), the reaction mixture unexpectedly contains 0,0-diethylisopropenylphosphonate (III). The bipolar ion (A) formed in the first stage is stabilized by migration of the proton in the form of a phosphonium ilide (B), rapidly converted to a quasiphosphonium derivative (C). The subsequent fate of the intermediate (C) is completely determined by two competing processes: dealkylation with the formation of (I) and ethylnitrite (Arbuzov reaction) or anionic exchange with the production of a quasiphosphonium derivative (D), the stabilization of which is accompanied by formation of compound III and nitrosophenol. 2 references.

USSR

UDC 547.244

SULFONYLILIDES. III. CONVERSION OF DIPHENYLBIS(PHENYLSULFONYL)METHYLPHINOXIDE

Leningrad ZHURNAL OБSHCHEY KHMII in Russian Vol. 44 No. 10, Oct 76 pp 2386-2387 manuscript received 19 Apr 76

KOLODYAZHNYY, O.I., Institute of Organic Chemistry, Acad. Sci. UkrSSR

[Abstract] The author recently produced diphenylbis(phenylsulfonyl)methylphinoxide (I) -- a strong CH acid. The powerful inductive effect of substituents determines the high mobility of the proton, as well as the low electron level and significant carbanion rigidity. The reaction of I with diazomethane forms an O-methylated product II. Other reactions of I are briefly described.

USSR

UDC 547.341.139.81+547.391

"CARBOMIDIZATION" REACTIONS WITH THE PARTICIPATION OF TRIVALENT PHOSPHORUS ACID AMIDES

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76 p 2384  
manuscript received 23 Mar 76

BATYYEVA, E.S., OFITSEROV, Ye.N., IVASYUK, N.V., PUDOVIK, A.N., Institute of  
Organic and Physical Chemistry, Kazan' Affiliate, Acad. Sci. USSR

[Abstract] The reaction of  $\text{P}^{\text{III}}$  acid amides with trifluoroacetic acid results in the formation of  $\text{P}^{\text{III}}$  acid esters and substituted trifluoroacetic acid amides. The reaction of "carbomidization" occurs due to acid impurities present in the amidophosphite (dimethylamine chlorohydrate). The interaction begins with initial protonation of the amidophosphate by the amine chlorohydrate at 25 C. Without acid impurities, a temperature of 140 C is necessary and hexametapol is formed. The results produced show that the interaction at the nitrogen atom of amidophosphite does not occur without acid impurities and the reaction of amidophosphites with carbonyl compounds occurs at the phosphorus atom. 3 references.

USSR

UDC 547.26'118

THE INTERACTION OF DIMETHYLPHOSPHORUS ACID ISOCYANATE WITH TRIMETHYL PYRUVIC ACID NITRILE AND METHYL PYRUVATE

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76 pp 2384-2385  
manuscript received 18 Feb 76

KONOVALOVA, I.V., GAREYEV, R.D., BURNAYEVA, L.A., FASKHUTDINOVA, T.A.,  
PUDOVIK, A.N., Kazan' State University

[Abstract] Continuing their study of the reactions of isocyanates of three-coordination phosphorus acids with carbonyl compounds, the authors synthesize for the first time dimethylphosphorous acid isocyanate (I). I is formed with a yield of 50% by interacting dimethylphosphorous acid chloride with sodium cyanate in benzene at 75 C. 3 references.

USSR

UDC 547.752'26.118.07

THE INTERACTION OF CARBONYL DERIVATIVES OF INDOLE WITH ORGANOPHOSPHORUS COMPOUNDS WITH ACTIVE METHYLENE GROUP

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76  
p 2381 manuscript received 31 Mar 76

RAZUMOV, A.I., GUREVICH, P.A., MUSLIMOV, S.A., USACHEVA, V.G., The Kazan' Institute of Chemical Technology imeni S.M. Kirov

[Abstract] The authors studied the reaction of indole-3-aldehyde (I) and isatine (II) with dialkyl(aryl)carboethoxymethylphosphine oxides (III). The reaction was conducted by boiling equimolecular quantities of (I) or (II) with (III) in toluene in the presence of piperidine and absolute ethanol. The reaction products also included the ethyl ester of 3-indolylacrylic acid and 3-carboethoxymethyleneoxidol. 4 references.

USSR

UDC 547.26'118

REGROUPING IN THE SERIES OF MONOXIDES OF ASYMMETRICAL DIALKYLDIARYLDIPHOSPHINES

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76 pp 2382-2383 manuscript received 3 Mar 76

FOSS, V.L., SOLODENKO, V.A., LUTSENKO, I.F., Moscow State University

[Abstract] It has been earlier shown that monoxides of asymmetrical diphosphines of the structure  $R_2P(O)-P(OR')_2$  irreversibly regroup to  $R_2P-P(O)(OR')_2$ , the direction of isomerization resulting from the fact that in the thermodynamically more stable compound the four-coordination phosphorus atom is surrounded by ligands with greater donor properties. The authors studied the limits to which the difference in surroundings of the phosphorus atom could be decreased before the regrouping stopped being irreversible. It was found that stabilization of the monoxides requires the donor influence of the alkyl groups. When dibutylphosphinous acid was reacted with diisopropylchlorophosphine, the difference in the surroundings of the phosphorus atom was apparently insufficient to provide preferential stability of any one compound. 4 references.

USSR

UDC 543.253+546.221

ANODIC POLAROGRAPHY OF SULFUR-CONTAINING ORGANIC COMPOUNDS. VI. DIALKYL(OR ALKYLAMINO) THIOPHOSPHATES, DIALKYLDITHIOPHOSPHATES

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76  
pp 2312-2317 manuscript received 22 Mar 75

SUPIN, G.S., KAYUSHINA, Ye.N., ITSKOVA, A.L., MANDEL'BAUM, Ya.A., All-Union Scientific Research Institute for Chemical Plant Protection Substances

[Abstract] An earlier report showed that in the presence of dialkyldithiophosphoric acid (A), anodic waves arise which are related to the formation of compounds with mercury. In this report, their properties, as well as the behavior of dialkylthiophosphoric acid (B) and thiophosphoric acid alkylamides (C) are studied in detail. An LP-60 polarograph and remote saturated calomel electrode are used, and oxygen is removed by blowing through helium. Polarography is performed in aqueous solutions using universal buffer solutions. 12 references.

USSR

UDC 546.183:325

THE FORMATION OF PHOSPHITE- AND HYPOPHOSPHITE-PERMANGANATE COMPOUNDS IN AQUEOUS SOLUTIONS

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76  
p 2380 manuscript received 18 Mar 76

VASIL'YEV, I.A., NECHAYEV, A.F., Leningrad Institute of Technology imeni Lensovet

[Abstract] The authors discovered that when incompletely oxidized forms of phosphorus are interacted with dilute aqueous solutions of potassium permanganate, stable colored compounds are formed, the absorption spectrum of which is similar to the absorption spectrum of permanganate ions. A slight decrease in absorption is observed in the band with  $\lambda_{\text{max}} \approx 516$  nm, plus multiple increase in absorption in the UV area of the spectrum. 3 references.

USSR

UDC 547.26'118

DIALKYLTHIONOTHIOLPHOSPHORIC ACID DERIVATIVES. I. O,O-DIALKYL-S-2-ISOCYANATOETHYLTHIONOTHIOLPHOSPHATES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76  
pp 2233-2237 manuscript received 26 Feb 75

GUBNITSKAYA, Ye.S., ZOLOTAREVA, L.A., SEMASHKO, Z.T., Institute of Organic Chemistry, Acad. Sci. UkrSSR

[Abstract] The authors found that dialkylthionothiolphosphoric acid esters react easily with phosgene in the presence of triethylamine to yield O,O-dialkyl-S-(chlorocarbonyl)thionothiolphosphates, colorless fluids which distill under vacuum without decomposition. When these products react with ethyleneimine they form unstable O,O-dialkyl-S-(ethyleneiminocarbonyl)thionothiolphosphates, which are converted to O,O-dialkyl-S-2-isocyanatoethylthionothiolphosphates. When these products are interacted with alcohols, amines and diphenylketimine, the products are, respectively: O,O-dialkyl-S-2-alkoxycarbonylamidoethylthionothiolphosphates, O,O-dialkyl-S-2-(N-arylureido)ethyl- and O,O-dialkyl-S-2-(N-diphenylmethylene-ureido)ethylthionothiolphosphates. 4 references.

USSR

UDC 547.341

THE EFFECT OF CARBON TETRACHLORIDE AND CHLORAL ON THE ALKYL ESTERS OF CERTAIN ARYLALKYLPHOSPHINOUS ACIDS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76  
pp 2237-2242 manuscript received 17 Feb 75

KHARRASOVA, F.M., YEFIMOVA, V.D., SALAKHUTDINOV, R.A., ZYKOVA, T.V., Kazan' Institute of Chemical Technology

[Abstract] The authors studied the interaction of  $\beta$ -chloroethyl, ethyl and propyl esters of phenylethyl- and p-tolyethylphosphinous acids with carbon tetrachloride, as well as the action of chloral on ethyl esters of p-bromophenyl-ethyl- and  $\alpha$ -naphthylethylphosphinous acids. Under conditions excluding the possibility of presence of phosphinous acids in the esters, the primary reaction product with  $CCl_4$  is the corresponding arylethyltrichloromethylphosphine oxide. The reaction is accompanied by secondary processes of isomerization, oxidation, formation of the acid chloride and free arylethylphosphinic acid. When  $\beta$ -chloroethyl ester of phenylethylphosphinous acid is reacted with  $CCl_4$ , the ester is isomerized at the  $\beta$ -chloroethyl group. The reaction product of the phosphinous esters with chloral is the  $\beta,\beta$ -dichlorovinyl ester of the corresponding arylethylphosphinic acid. 17 references.

USSR

UDC 546.185

INTERACTION OF DIALKYL CYANIMIDES WITH DIALKYL ESTERS OF DITHIOPHOSPHORIC ACID

Leningrad ZHURNAL OБSHCHEY KHMII in Russian Vol. 44 No. 10, Oct 76  
pp 2227-2229 manuscript received 13 Jun 75

KOSINSKAYA, I.M., PISANENKO, N.P., KAL'CHENKO, V.I.

[Abstract] When dialkylcyanimides are interacted with 0,0-dialkyl esters of dithiophosphoric acid, dialkyl esters of isothiocyanatothiophosphoric acid, dialkylamine salts of dialkyldithiophosphoric acids and unsubstituted N,N-dialkylthiourea are produced. The formation of reaction products depends on the sequence of mixing of the initial reagents. 4 references.

USSR

UDC 547.341.26'118.07

METHYLPHOSPHONATE HYDROCHLORIDES WITH AN IMIDATE GROUP IN THE ESTER RADICAL

Leningrad ZHURNAL OБSHCHEY KHMII in Russian Vol. 44 No. 10, Oct 76  
pp 2229-2233 manuscript received 6 Jun 75

SHISHKIN, V.Ye., YUKHNO, Yu.M., NO, B.I., MAMUTOVA, N.N., Volgograd  
Polytechnical Institute

[Abstract] Continuing their studies of the phosphorylated imino esters, in order to study the reactivity and biological activity of these compounds, the authors synthesized methylphosphonate hydrochlorides with unsubstituted imidate group in the ester radical -- mixed alkyl- $\omega$ -imino- $\omega$ -alkoxyalkylmethyl-phosphonate hydrochlorides (II). This work presents a report on the production of II phosphorylated imino esters from alkylcyanalkylmethylphosphonates and certain of their chemical properties. It is found that they interact with alcohols to form mixed alkyl, carbalkoxyalkylmethylphosphonates. When heated, they decompose into alkyl- $\omega$ -carbamoylalkylmethylphosphonates and alkyl chlorides. 5 references.

USSR

UDC 547.448'558.1

$\beta$ -ACYLVINYLTRIPHENYLPHOSPHONIUM CHLORIDE ARYLHYDRAZONES AND PHOSPHONIUM-VINYLAZINEQUINONES

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76  
pp 2220-2225 manuscript received 6 Jun 75

MEGERA, I.V., SHEVCHUK, M.I., Chernovitskiy State University

[Abstract] Conditions are developed for synthesis of phenyl-, 4-nitrophenyl- and 2,4-dinitrophenyl hydrazones of  $\beta$ -acylvinyltriphenylphosphonium salts of C1 [ $\text{pH}_3\text{P}-\text{CH}=\text{CH}-\text{C}(\text{R})=\text{N}=\text{NH}-\text{Ar}$ ]. Dehydrochlorination of the  $\beta$ -acylvinyltriphenylphosphonium chloride arylhydrazones produced yields quinone azinophosphonium dyes, which have very intensive absorption maxima in the visible area of the light spectrum. The greatest color stability is that of the dinitro derivatives. 3 references.

USSR

UDC 547.724.3

INVESTIGATIONS IN THE AREA OF UNSATURATED LACTONES. XXX. INTERACTION OF 3-ACETYL- $\Delta^3$ -BUTENOLIDES WITH DIALKYLPHOSPHITES

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76  
pp 2225-2226 manuscript received 12 Jun 75

AVETISYAN, A.A., DZHANDZHAPANYAN, A.N., DANGYAN, M.T., Yerevan State University

[Abstract] A study of the interaction of 3-acetyl-4,5,5-trialkyl- $\Delta^3$ -butenolides with dimethyl- and diethylphosphites showed that with equimolar quantities of the initial components, dialkyl esters of 1-butenolidyl-1-oxyethylphosphonic acids are formed with yields of 45-84%. The reaction proceeds well in the presence of catalytic quantities of diethylamine at room temperature. The desired end products could not be produced when the reaction was attempted in the presence of sodium ethylate. The dialkyl esters produced have not been previously described in the literature. 5 references.

USSR

UDC 547.241

THE REACTIVITY OF DIPHOSPHORUS (III) SUBSTITUTED ACETIC ACIDS

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76  
pp 2213-2217 manuscript received 21 Apr 75

NOVIKOVA, Z.S., SKOROBOGATOVA, S.Ya., LUTSENKO, I.F., Moscow State  
University

[Abstract] A study is made of the reactivity of esters of diphosphorous (III) substituted acetic acids in the reactions of hydrolysis, alcoholysis, aminolysis and acidolysis. It is established that in these reactions, one of the phosphorus-containing radicals is split off, the selectivity of the reaction being determined by the nature of the substituents at the phosphorus atom. Splitting of the phosphorus-carbon bond occurs at the phosphorus atom containing the more electron-acceptor substituents. The ease of splitting of the phosphorus-carbon bond depends on the nucleophilicity and electrophilicity of the reagent used; the reaction is significantly accelerated under conditions of acid catalysis. 9 references.

USSR

UDC 546.185

INTERACTION OF 1-TRICHLOROPHOSPHAZO-1,1-DICHLOROALKANES WITH NITRILES

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76  
pp 2217-2220 manuscript received 2 Jun 75

KUKHAR', V.P., BOYKO, A.P., Institute of Organic Chemistry, Acad. Sci. UkrSSR

[Abstract] In an earlier report, the authors described the reaction of 1-trichlorophosphazo-1,1-dichloroalkanes with nitriles containing an activated methylene group. They have now found that the reaction of 1-trichlorophosphazo-1,1-dichloroalkanes (I) with nitriles containing a  $\text{CH}_2$  group in the  $\alpha$  position is more general in nature and is not limited to the most active compounds which were tried in the earlier experiments. These reactions also involve acetonitrile, propionitrile, buteronitrile, chloroacetonitrile, forming substituted 2,2,6-trichloro-1,3-diaza-2-phosphorines (II). The interaction of (I) with nitriles occurs at 130-190 C without a solvent in the presence of catalytic (about 5%) quantities of aluminum chloride. 1 reference.

USSR

UDC 547.26'118

METHOD OF PRODUCTION OF ALKYL ESTERS OF ARYLALKYLPHOSPHONOUS ACIDS

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76  
pp 2208-2209 manuscript received 19 Jun 75

YEFIMOVA, V.D., KHARRASOVA, F.M., KEL'BEDINA, Z.A., ABOLONINA, I.B., Kazan'  
Chemical and Technical Institute imeni S.M. Kirov

[Abstract] A method is developed for production of alkyl esters of arylalkyl-phosphinous acids by alcoholysis of arylalkyl-N,N-diethylamidophosphines. The synthesis of these compounds by this method has not been described in the literature before. The method is simple in technology and allows the production of end products with good yield and high purity. The method is not convenient for the synthesis of phenyl esters, since it is difficult to eliminate all of the phenol from the product. 4 references.

USSR

UDC 547.71+661.718.1

SYNTHESIS OF 2-METHYL-3-OXO-3-ETHOXY-6,3-OXAPHOSPHABICYCLO [3,1,0] HEXANE  
AND SOME OF ITS CONVERSIONS

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol. 44 No. 10, Oct 76  
pp 2209-2213 manuscript received 9 Jan 74

ZUBTSOVA, L.I., BYCHKOV, V.I., RAKOV, A.P., ANDREYEV, G.F., Chuvash State  
University

[Abstract] 2-methyl-3-oxo-3-ethoxy-6,3-oxaphosphabicyclo [3,1,0] hexane is synthesized. Upon interaction with ethanol and acetic anhydride in the presence of sodium ethylate, it is converted to unsaturated alcohols or unsaturated monoacetates. The product of interest was produced by transforming phospholene as had been earlier described for 3-phospholenes with an unsubstituted double bond. 3 references.

USSR

UDC 661.183.7.546.881.183

STUDY OF THE REDOX REACTIONS OF PHOSPHORUS TRICHLORIDE AND VANADIUM(V)  
OXYFLUORIDE WITH VANADIUM(V) AND PHOSPHORUS(III)-CONTAINING SILICA GEL

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol 44, No 10, Oct 76 pp 2166-  
2169 manuscript received 29 Jan 75

MALYGIN, A. A., VOLKOVA, A. N., KOL'TSOV, S. I., ALESKOVSKIY, V. B.,  
Leningrad Institute of Technology imeni Lensovet

[Abstract] A study was made of the interaction of phosphorus(III)-containing silica gel with  $VOCl_3$  and vanadium(V)-containing silica gel with  $PCl_3$ . It was demonstrated that the chemosorption of  $VOCl_3$  and  $PCl_3$  is primarily due to redox reactions, forming oxide layers with a definite mutual placement of the phosphorus(V) and vanadium(III) oxygen monolayers. 12 references.

USSR

UDC 547.244.233

THE MECHANISM OF THE REACTIONS OF TRANSAMIDIZATION AND ALCOHOLYSIS OF  
AMIDOPHOSPHITES

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian Vol 44, No 10, Oct 76  
pp 2204-2207 manuscript received 29 May 75

BATYYEVA, E. S., AL'FONSOV, V. A., ZAMALETDINOVA, G. U., PUDOVIK, A. N.,  
Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Kazan'  
Affiliate, Acad. Sci. USSR

[Abstract] A study was made of the role of amine chlorohydrates in trans-amidization and alcoholysis of trivalent phosphorus acid amides. Thus, upon interaction of diethylphosphorous acid diethylamide with aniline chlorohydrate at room temperature, diethylphosphorous acid anilide is formed. In accordance with the reaction plan suggested by the authors, the interaction begins with protonation of the more basic nitrogen atom of the dialkyl-amidophosphite by aniline chlorohydrate, forming a chlorophosphite and a mixture of amines of various basicities. The transamination reaction results from the fact that the chlorophosphite interacts with the aniline forming the anilidophosphite. Modeling of the last stage of the reaction confirmed the assumption made: diethylchlorophosphite interacts with a mixture of aniline and diethylamine to form anilidophosphite. The trans-amination of dialkylamidophosphites of aromatic amines in the presence of amine chlorohydrates occurs by a similar reaction. 8 references.

USSR

UDC 542.91:547.1'118:547.594.3

THE INTERACTION OF PhPCl<sub>2</sub> WITH CYCLOHEXANONE IN THE PRESENCE OF WATER

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA KHMICHESKAYA in Russian No 11, Nov 76 pp 2638-2639 manuscript received 8 Jul 76

KARDANOV, N. A., GODOVIKOV, N. N., and KABANCHIK, M. I., Institute of Elementoorganic Compounds, USSR Academy of Sciences, Moscow

[Abstract] It is shown for the first time that the chloranhydride of phenyl- $\alpha$ -oxycyclohexylphosphinic acid is formed during the interaction of PhPCl<sub>2</sub> with cyclohexanone in the presence of water. References 2: 1 Russian, 1 Western.

USSR

UDC 541.11:542.92:547.1'118

THE THERMAL DECOMPOSITION OF 2-OXYALKYLTHIOLIC PHOSPHOROUS-ACID ESTERS

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA KHMICHESKAYA in Russian No 11, Nov 76 pp 2625-2627 manuscript received 14 May 76

NURETDINOVA, O. N., GUSEVA, F. F., and ARBUZOV, B. A., Institute of Organic and Physical Chemistry of the Kazan' Branch of the USSR Academy of Sciences

[Abstract] In an investigation of the thermal decomposition of 2-oxyalkylthiolic phosphorous-acid esters, it is found that the decomposition of such esters at normal pressure brings about alkylene sulfides and the corresponding acids of phosphorus. The direction of the reaction of thermal decomposition of these esters in a vacuum depends upon the structure of the substituents at the phosphorus atom. References 5: 3 Russian, 2 Western.

USSR

UDC 541.57:546.11:541.6:547.1'118

HYDROGEN BONDS AND THE STRUCTURE OF PHOSPHORUS-CONTAINING OXIMES

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA KHMICHESKAYA in Russian No 11, Nov 76 pp 2616-2619 manuscript received 4 May 76

TRUTNEVA, YE. P., SHAGIDULLIN, R. R., BORISOVA, YE. YE., and VAFINA, N. M., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov of the Kazan' Branch of the USSR Academy of Sciences

[Abstract] A series of phosphorus-containing oximes is investigated from the viewpoint of the nature of the intramolecular self-associates formed

by them in the crystalline phase and in  $\text{CCl}_4$  solutions, as well as from the viewpoint of the conformation of nonassociated molecules. The analysis is conducted on the basis of absorption bands of the basic tone of the valent oscillations of the hydroxyl group. Tables 1; references 9: 2 Russian, 7 Western.

USSR

UDC 547.26'118

A NEW FORM OF INTRAMOLECULAR INTERACTION OF SYMMETRICAL METHANE-PHOSPHONIC ACID DIARYL DERIVATIVES

Leningrad ZHURNAL OБSHCHEY KHMII in Russian No 11, Nov 76 pp 2624-2625  
manuscript received 23 Jan 76

ZAVLIN, P. M., ASHKINAZI, L. A., IONIN, B. I., and IGNATOVICH, YA. L.,  
Leningrad Institute of Motion-Picture Engineers

[Abstract] A phenomenon has been discovered in symmetrical methane-phosphonic acid diaryl diesters, which is connected with desymmetrization of the electronic organizations of the benzene rings, brought about by a varied degree of participation of unshared electron pairs of oxygen atoms in interactions with the electron system of the phosphorus atom. As a result thereof, the difference in the electron densities of the benzene rings of symmetrical methane-phosphonic acid diaryl diesters turns out to be sufficient for the formation of a monomolecular autocomplex with a charge transfer. This is expressed in the appearance of conformers with parallel-situated benzene nuclei of a synclinal and antiperiplanar structure among the methane-phosphonic acid diaryl diesters. References 2: 1 Russian, 1 Western.

USSR

UDC 547.315.1.341+547.467.2

THE REACTIVITY OF PHOSPHINYL ALLENES IN REACTIONS WITH DIAZOACETATE

Leningrad ZHURNAL OБSHCHEY KHMII in Russian No 11, Nov 76 p 2624 manuscript  
received 23 Jan 76

KHUSAINOVA, N. G., TIMOSHINA, T. V., and PUDOVIK, A. N., Kazan' State  
University imeni V. I. Ul'yanov-Lenin

[Abstract] There is conducted a kinetic investigation of the reaction of the cyclical addition of diazoacetate to allenyl phosphonates and allenyl phosphine oxides  $\text{XYP(O)CH}=\text{C}=\text{CH}_2$ , which leads to the formation of phosphinyl pyrazoles. Obtained values of the rate constants and activation parameters are specified.

USSR

UDC 547.341+546.185.131

THE PHOSPHORYLIZATION OF ALKENES-1 WITH VOLUMETRIC SUBSTITUENTS

Leningrad ZHURNAL OБSHCHEY KHMII in Russian No 11, Nov 76 p 2623 manuscript received 8 Jan 76

ROZINOV, V. G., RYBKINA, V. V., PENSIONEROVA, G. A., GLUKHIKH, and GRECHKIN, YE. F., Irkutsk State University, Institute of Petrochemical and Coal-Chemistry Synthesis attached to the Irkutsk State University

[Abstract] There is conducted the phosphorylization of  $RCH=CH_2$  alkanes, where  $R=Bu$ ,  $n.-C_5H_{11}$ ;  $R'C(Me)=CH_2$ , where  $R'=Me$ , Et,  $PhCH_2$ ,  $t-BuCH_2$ , as well as of camphene by phosphorus pentachloride in a solution at room temperature. The conclusion is drawn that alkenes which have a single alkyl substituent of normal structure actually do yield only the addition product during phosphorylization. The phosphorylization of gem-substituted alkenes brings about a mixture of substitution products and addition products, the share of the substitution product rising as the volume of the alkyl substituent increases from 34% for isobutylene to 100% for di-isobutylene and camphene. References 7: 4 Russian, 3 Western.

USSR

UDC 541.579

THE DIPOLE MOMENTS OF PHOSPHORORGANIC COMPOUNDS. IV

Leningrad ZHURNAL OБSHCHEY KHMII in Russian No 11, Nov 76 pp 2613-2619 manuscript received 17 Mar 75

VDOVENKO, S. I., SEMENIY, V. YA., YEGOROV, YU. P., BOROVIKOV, YU. YA., and ZAVATSKIY

[Abstract] In the continuation of a systematic study of the dipole moments of phosphororganic compounds, it is found that trialkyl phosphine sulfides in the liquid phase represent an equilibrium mixture of rotatable conformers with approximately identical values of the dipole moments. The moments of the P=S bonds virtually do not depend upon the length of the hydrocarbon radicals. In triperfluoralkyl phosphine oxides the moment of the phosphoryl bond is depressed as a consequence of the induction influence of strongly electrically negative adjacent substituents, the dipole moments of the molecules are directed towards the perfluoralkyl radicals. Hexamethyl phosphor triamide in the liquid phase is nonassociated and is conformationally homogeneous. The moment of the P-N bond is very sensitive to the valent state of the phosphorus atom. Figures 2; tables 3; references 23: 15 Russian, 8 Western.

USSR

UDC 541.5+547.241

INVESTIGATION OF THE NATURE OF HYDROGEN BONDS IN COMPLEX PHOSPHORORGANIC COMPOUNDS WITH VARIOUS PROTON DONORS. II

Leningrad ZHURNAL OБSHCHEY KHMII in Russian No 11, Nov 76 pp 2608-2612  
manuscript received 12 May 75

BOROVIKOV, YU. YA., YEGOROV, YU. P., and SEMENIY, V. YA., Institute of Organic Chemistry, Ukrainian SSR Academy of Sciences

[Abstract] In the continuation of a systematic investigation of the nature of hydrogen bonds, it is found that the electrical properties of trialkyl phosphine sulfide complexes with various proton donors within the hydrogen-bond enthalpy interval of 0-9 kcal/mole may be described within the framework of a simple electrostatic model. The  $-\Delta H$  of trialkyl phosphine sulfide complexes is approximately 1.5 times smaller than the  $-\Delta H$  of trialkyl phosphine oxide complexes with the same proton donors. The thermodynamic and electrical properties of the tributyl phosphine sulfide complexes with monochloracetic acid and trichloracetic acid are anomalous. The relationship of  $\Delta v$  (P=X) to  $-\Delta H$  for the trimethyl phosphine sulfide complexes is linear, and for the trimethyl phosphine oxide complexes is nonlinear. In phosphine oxide complexes with a composition of 2:1, both acid molecules are probably directly bound to the phosphoryl group. Figures 4; tables 3; references: 17 Russian.

USSR

UDC 541.60+547.241'248

THE FRAGMENTATION OF KETOPHOSPHORYL COMPOUNDS DURING AN ELECTRON COLLISION

Leningrad ZHURNAL OБSHCHEY KHMII in Russian No 11, Nov 76 pp 2545-2550  
manuscript received 28 Feb 75

LASKORIN, B. N., YASHKIN, V. V., and SOKAL'SKAYA, L. I.

[Abstract] In a study of the dissociative ionization of ketophosphoryl compounds during an electron collision, a low stability of the molecular ketophosphoryl-compound ion is manifested. This ion is characterized by the decomposition noted during the study of ketone fragmentation. It is shown that the least stability in  $\alpha$ -ketophosphoryl compounds with respect to the action of an electron collision is possessed by the P(0)-C(0) bond. Tables 1; references 12: 6 Russian, 6 Western.

USSR

UDC 547.341

DERIVATIVES OF ALKENYLPHOSPHONOUS ACIDS AND SOME OF THEIR PROPERTIES

Leningrad ZHURNAL OБSHCHEY KHMII in Russian No 11, Nov 76 pp 2513-2517  
manuscript received 16 Apr 75

KRYLOV, L. V., KORMACHEV, V. V., and KUKHMIN, V. A., Chuvash State  
University imeni I. N. Ul'yanov

[Abstract] In a discussion of the derivatives of alkenylphosphonous acids and some of their properties, it is ascertained that during decomposition of the adduct of phosphorus pentachloride with simple dialkyl ethers, alcoxyalkenyldichlorophosphines are obtained. When they are acted upon by alcohols in the presence of triethylamine, dialkyl- $\beta$ -alcoxyalkenylphosphonites are formed. Dialkylalkenylphosphonites react with acrolein and acrylic acid with the formation of alkyl- $\beta$ -alcoxyalkenyl- $\gamma$ -alcoxypropenyl-2-phosphinates and alkylalkenyl- $\beta$ -alcoxycarbonylethylphosphinates, respectively. There is proposed a reaction mechanism via the formation of an oxophospholan derivative or a seven-membered cyclical ilide. Tables 2; references: 6 Russian.

USSR

UDC 547.26'118+543.253

INTERACTION OF CHLORAL AMIDES OF PHOSPHORYLIZED ACETIC ACIDS WITH ISOCYANATES

Leningrad ZHURNAL OБSHCHEY KHMII in Russian No 11, Nov 76 pp 2508-2513  
manuscript received 8 Apr 75

SUKHOVEYEVA, I. B., PUSHINA, M. YA., SUPIN, G. S., and SVETSOVA-SHILOVSKAYA, K. D., All-Union Scientific Research Institute of Chemical Media for Plant Protection

[Abstract] In an investigation of chloral amides of phosphorylized acetic acids with isocyanates, it is ascertained that the direction of the reaction of S-[1-oxy-2,2,2-trichlorethyl]carbamoylmethyl]thio- and -dithiophosphates or -phosphonates with aliphatic isocyanates depends upon the catalyst: in the presence of tin dibutyl diacetate, carbamoylized derivatives with respect to the oxy group are formed, whereas animals are formed in the presence of triethylamine. During interaction of the indicated compounds with aryl-isocyanates only animals are formed, in the presence of triethylamine as well as in the presence of tin dibutyl diacetate. Figures 1; tables 3; references 5: 2 Russian, 3 Western.

USSR

UDC 547.76'118

2-HALOGEN-1,2-OXAPHOSPHOLENES WITH TRIVALENT PHOSPHORUS. DERIVATION AND SOME CONVERSIONS

Leningrad ZHURNAL OBSHCHEY KHMII in Russian No 11, Nov 76 pp 2501-2508  
manuscript received 17 Mar 75

ARBUZOV, B. A., VIZEL', A. O., SHCHUKINA, L. I., ZYABLIKOV, T. A., and SHAGIDULLIN, R. R., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Kazan' Branch of the USSR Academy of Sciences

[Abstract] In a discussion of the acquisition of 1,2-oxaphospholene derivatives with a trivalent phosphorus atom, it is ascertained that the appropriate chlorophosphonites are obtained by the reduction of 2-thioxo-2-chlor-1,2-oxaphospholenes-4 derivatives. On their basis are synthesized the P-esters and the P-amide. It is shown that the Arbuzov reaction is accompanied by a disruption only of the exocyclic ester bond. Change of the phosphorus coordination number exerts an essential influence upon some spectral characteristics of the 1,2-oxaphospholene-4 derivative. Figures 1; tables 2; references 28: 14 Russian, 14 Western.

USSR

UDC 547.574.4+547.7+546.183+547.821

CONCERNING SYNTHESIS OF THE DIETHYL ESTERS OF 6-METHYL-2-QUINOLYL(ARYLAMINO)-METHYLPHOSPHONIC ACIDS AND 6-METHYL-2-QUINOLYL(AMINOPYRIDYL)METHYLPHOSPHONIC ACIDS

Leningrad ZHURNAL OBSHCHEY KHMII in Russian No 11, Nov 76 pp 2498-2501  
manuscript received 27 Jun 75

LUGOVKIN, B. P., All-Union Scientific Research Institute of Labor Protection, Kazan'

[Abstract] In a discussion of synthesis of the diethyl esters of 6-methyl-2-quinolyl(aryl amino)methylphosphonic acids and 6-methyl-2-quinolyl(aminopyridyl)methylphosphonic acids, it is noted that 6-methyl-2-quinolylarylazomethins and 6-methyl-2-quinolylpyridylazomethins were synthesized by the condensation of 6-methyl-2-quinolinealdehyde with aromatic amines and aminopyridines. By their interaction with diethyl phosphorous acids in the presence of sodium methylate were synthesized the diethyl esters of the acids enumerated in the article title. 5-(6-methyl-2-quinolidene)-3-alkylrodanines were synthesized by the condensation of 6-methyl-2-quinolinealdehyde with alkylrodanines in the presence of piperidine. Tables 3; references 7: 5 Russian, 2 Western.

USSR

UDC 547.241

INTERACTION OF CHLORMETHYLDIBENZYLPHOSPHINOXIDE WITH SOME NUCLEOPHYLIC AGENTS

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian No 11, Nov 76 pp 2494-2497  
manuscript received 30 Jun 75

PETROV, K. A., CHAUZOV, V. A., YEROKHINA, T. S., and PASTUKHOVA, I. V.

[Abstract] In an investigation of the interaction of chlormethyldibenzylphosphinoxide with some nucleophylic agents, it is shown that this interaction may proceed, in relation to the nucleophilicity and basicity of the nucleophylic agents, with regrouping and the formation of derivatives of benzyl-2-phenylethylphosphinic acid (KOH, n.-BuONa), as well as without regrouping (EtSNa, Et<sub>2</sub>NH<sub>2</sub> PhONa). References 5: 3 Russian, 2 Western.

USSR

UDC 547.313.2:547.341

THE INTERACTION OF TRIALKYLPHOSPHITES WITH  $\alpha$ -BROMVINYLPHOSPHONATES

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian No 11, Nov 76 pp 2492-2494  
manuscript received 23 Jun 75

PUDOVIK, A. N. and VERSHININA, G. YE., Kazan' State University

[Abstract] In an effort to ascertain some rules governing the reaction of the Arbuzov regrouping, in which  $\alpha$ -bromvinylphosphonates are capable of participating with the formation of 1,2-diphosphonethylenes, and in expanding the boundaries of the application of this reaction, it was ascertained that 1-replaced 1,2-diphosphonethylenes are obtained by the interaction of 1-replaced  $\alpha$ -bromvinylphosphonates with trialkylphosphites. It is shown that 1,2-diphosphonethylenes possess transconfiguration. Tables 1; references: 2 Russian.

USSR

UDC 547.26'118

THE THERMAL ISOMERIZATION OF TRIETHYL-N-(ETHOXYMETHYLTHIOPHOSPHINYL) IMIDOPHOSPHATE

Leningrad ZHURNAL OBSCHEY KHIMII in Russian No 11, Nov 76 pp 2482-2487  
manuscript received 29 May 75

KHODAK, A. A., GILYAROV, V. A., SHCHERBINA, T. M., and KABACHNIK, M. I.,  
Institute of Elementoorganic Compounds, USSR Academy of Sciences

[Abstract] In an investigation of the thermal isomerization of triethyl-N-(ethoxymethylthiophosphinyl)imidophosphate, it was determined that this process takes place at 130°C for a duration of 10 hours with the formation of 0-ethyl-S-ethyl-N-(diethoxyphosphinyl)methylimidothiophosphonate. The material of this article has been presented in September 1974 at the Second Symposium on Inorganic Phosphorus Compounds in Prague. Figures 2; tables 1; references 15: 11 Russian, 4 Western.

USSR

UDC 547.241+547.235.41

THE REACTIONS OF SOME PHOSPHORORGANIC DIAZOALKANES WITH COMPLETE PHOSPHITES

Leningrad ZHURNAL OBSCHEY KHIMII in Russian No 11, Nov 76 pp 2487-2492  
manuscript received 19 Jun 75

GAREYEV, R. D. and PUDOVIK, A. N., Kazan' State University imeni V. I. Ul'yanov-Lenin

[Abstract] There were studied the reactions of some phosphororganic diazoalkanes with complete phosphites which, on one hand, can play the part of a base, thereby facilitating the process of their P-C decomposition, but on the other hand, as typical nucleophilic reagents can also bring about the appropriate phosphazine systems. It was found that as a result of reactions of phosphororganic diazoalkanes of the "aldol" type with triethylphosphite there were obtained the corresponding phosphazines, which hydrolyze easily to the corresponding hydrazones of the esters of  $\alpha$ -hydroxy- $\alpha$ -methyl- $\alpha$ -dimethoxyphosphinylpyrotartaric acid. The reaction of dimethoxy- $\alpha$ -hydroxy- $\alpha$ -carboethoxydiazomethylphosphonate with trimethylphosphite is accompanied by the formation of a corresponding phosphazine, as well as by the P-C decomposition of the initial diazoalkane to ethyldiazoacetate and dimethyl phosphite. Figures 3; references 20: 18 Russian, 2 Western.

USSR

UDC 547.387:547.'13+541.49

INTERACTION OF COMPLEXES OF TRIVALENT PHOSPHORUS COMPOUNDS AND COPPER HALOGENIDE (1) WITH KETENE AND BIS( $\alpha$ - OR  $\beta$ -CHLORVINYL) MERCURY

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian No 11, Nov 76 pp 2471-2477  
manuscript received 23 Jun 75

KAZANKOVA, M. A., SMIRNOVA, O. G., TROSTYANSKAYA, I. G., and LUTSENKO, I. F.,  
Moscow State University imeni M. V. Lomonosov

[Abstract] In an investigation of the interaction of complexes of trivalent phosphorus compounds and copper halogenide (1) with ketene and bis( $\alpha$ - or  $\beta$ -chlorvinyl) mercury, it is ascertained that interaction of the acetylene and ketone-acetylene monovalent copper halogenide complexes with phosphites and phosphines brings about the replacement of unsaturated ligands by a phosphororganic ligand. During the reaction of  $\alpha$ -chlorvinyl lithium with corrosive sublimate at  $-110^{\circ}$  there is synthesized bis( $\alpha$ -chlorvinyl) mercury, which with iodine, bromine, and chlorine mercury forms the corresponding mercurorganis salts. It is found that with interaction of the phosphite complex of copper iodide (1), with  $\alpha$ - and  $\beta$ -chlorvinyl mercury derivatives acetylene complexes of copper iodide are obtained. References 7: 4 Russian, 3 Western.

USSR

UDC 547.241

THE ADDITION OF SALTS OF MONOALKYL PHOSPHOROUS ACIDS TO UNSATURATED COMPOUNDS

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian No 11, Nov 76 pp 2477-2481  
manuscript received 29 Apr 75

LASKORIN, B. N., YASHKIN, V. V., and BULGAKOVA, V. B., All-Union Scientific Research Institute of Chemical Technology

[Abstract] In a study of the capability of monosubstituted salts of monoalkyl phosphorous acids to enter into the reaction of addition to various unsaturated compounds in the presence of catalysts, it has been found that salts of monoalkyl phosphorous acids combine with unsaturated organic compounds by a double bond in the presence of alkaline and peroxide catalysts in accordance with an ionic mechanism or a radical mechanism. A number of monoesters of substituted alkane phosphonic acids is obtained on the basis of the ionic mechanism of the addition reaction. Tables 1; references 16: 13 Russian, 3 Western.

USSR

UDC 541.128.12

THE KINETIC DIFFERENTIATING EFFECT IN PROTOPHYTIC DEUTEROHYDROGEN EXCHANGE REACTIONS WITH METHYLPHOSPHONIUM-ACID TETRAMETHYLDIAMIDE

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian No 11, Nov 76 pp 2433-2436  
manuscript received 20 May 75

RANNEVA, YU. I., SHAPIRO, I. O., OSINENKO, N. G., and SHATENSHTEYN, A. I.,  
Physicochemical Institute imeni L. Ya. Karpov

[Abstract] A stable catalytic system is obtained on the basis of methylphosphonium-acid tetramethyldiamide and its potassium-substituted one, which is suitable for some organic anion reactions. The reaction-rate constants of the deuterhydrogen exchange of CH-acids of varied structure in the indicated catalytic system and in the tertiary-butyrate potassium solution in the methylphosphonium-acid tetramethyldiamide (diaphos) were measured and compared. Tables 1; references 20: 14 Russian, 6 Western.

USSR

UDC 547.341

THE 1.3-DIPOLAR CYCLE ANNEXATION REACTION WITH THE PARTICIPATION OF ALLYLDIPHENYL PHOSPHINE

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian No 11, Nov 76 pp 2463-2467  
manuscript received 24 Jun 75

STEPANOV, I. A., ZAKHAROV, V. I., CHISTOKLETOV, V. N., and PETROV, A. A.,  
Leningrad Technological Institute imeni Lensoveta; Leningrad Technological Institute of the Cellulose and Paper Industry

[Abstract] In a study of the 1.3-dipolar cycle annexation reaction with the participation of allyldiphenyl phosphine, it was found that allyldiphenyl phosphine enters the reaction with nitrile amines as a bipolar system, forming products of mixed dimerization in accordance with the 3+3=6 scheme. The direction of the reactions of nitrile amines with ethylene phosphines, which have replacements at a multiple connection, is determined not only by the position of these replacements, but also by their nature. Tables 2; references 10: 8 Russian, 2 Western.

USSR

UDC 541.123.31

THE INTERACTION OF BENZAMIDE WITH SULFURIC ACID, SELENIC ACID, AND PHOSPHORIC ACID IN AQUEOUS SOLUTIONS

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian No 11, Nov 76 pp 2418-2421  
manuscript received 22 Mar 75

NURAKHEMOV, N. N., BEREMZHANOV, B. A., and YERKASOV, R. SH., Kazakh State University imeni S. M. Kirov

[Abstract] In a study of the solubility of benzamide in sulfuric acid, selenic acid, and phosphoric acid at 0 and 40° C, it has been found that with the acids under consideration, benzamide forms compounds with equimolecular compositions. Figures 3; references 3: 2 Russian, 1 Western.

USSR

UDC 546.18

THE POLAROGRAPHIC BEHAVIOR OF PHOSPHORUS TRIIODIDE

Leningrad ZHURNAL OБSHCHEY KHIMII in Russian No 11, Nov 76 pp 2431-2433  
manuscript received 20 Apr 76

KISIL', L. M., OSADCHENKO, I. M., and TOMILOV, A. P.

[Abstract] In the continuation of an investigation of the polarographic behavior of phosphorus halogenides, the electroreduction of phosphorus triiodide in acetonitrile on a mercury dropping electrode was studied. It was found that phosphorus triiodide is polarographically active in anhydrous acetonitrile on a mercury dropping electrode, and that the electroreduction proceeds stepwise with half-wave potentials of +0.40, -0.04, and -0.41 v with respect to the mercury bottom against a background of 0.08 molarity of the tetraethylammonium perchlorate solution in acetonitrile. Figures 3; references 5: 4 Russian, 1 Western.

USSR

UDC 615.31:547.853.3].099.015.11

CORRELATIONS BETWEEN THE TOXICITY AND THE STRUCTURAL PARAMETERS OF CERTAIN PHOSPHORYL DERIVATIVES OF PYRIMIDINE

Moscow KHMIMO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 10, No 12, Dec 76 pp 42-46

ORDUKHANYAN, A. A., KABANKIN, A. S., LANDAU, M. A., and GARIBDZHANYAN, Scientific-Research Institute for Biological Tests of Chemical Compounds, Kupavna, Moskovskaya Oblast

[Abstract] Correlation equations are obtained which tie together the reliable lethal dose (mole per 1 kg of body weight) with the structural parameters of 20 phosphoryl derivatives of pyrimidine. Conclusions are made regarding the orientation of the molecules studied with respect to the hydrophobic sections of the cell receptors. It is concluded that the substituents in the R" position have little effect on the toxicity of these compounds. In no single statistically significant equation was there simultaneously a sum of the lipophilic and a sum of the electron constants of all substitutes. This indicates a definite orientation of the molecule with respect to the hydrophobic sections of the cell receptors.

USSR

UDC 542.91:647.1'118

1,3-DIPOLAR CYCLOADDITION OF C-BENZOYL-N-PHENYLNITRON TO VINYL-, BETA-CYANOVINYAL-ALLYLPHOSPHONATES, AND THE ADDITION OF C, N-DIPHENYLNITRON TO ALLYLPHOSPHONATE

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA KHMICHESKAYA in Russian No 12, 1976 pp 2779-2785

ARBUZOV, B. A., SAMITOV, YU. YU., DIANOVA, E. N., and LISIN, A. F., Chemical Institute imeni A. M. Butlerov, and Kazan' State University

[Abstract] The reaction of the 1,3-dipolar cycloaddition of C-benzoyl-N-phenylnitron to dimethyl vinylphosphonate at 20°C was used to obtain the trans-2-phenyl-3-benzoyl-4-dimethylphosphono- and trans-2-phenyl-3-benzoyl-5-dimethylphosphonoisoxasolidines. With the reaction in boiling benzene, only the first of these isomers was obtained. The 1,3-dipolar addition of C-benzoyl-N-phenylnitron to the diethyl ester of beta-cyanovinyl phosphonic acid produces trans-2-phenyl-3-benzoyl-4-diethylphosphono-5-cyanisoasolidine. Finally, the cycloaddition of C, N-diphenylnitron to the dimethyl ester of allylphosphonic acid produces trans-2, 3-diphenyl-5-dimethyl-phosphonomethyleneisoxasolidine.

USSR

UDC 542.91:547.1'118

#### 4.5-BENZO-1,3,2-THIAZAPHOSPHOLANES

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA KHMICHESKAYA in Russian No 12, 1976 pp 2837-2839

PUDOVIK, M. A., MOROZOVA, N. P., and PUDOVIK, A. N., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, and the Kazan' Branch of the Academy of Sciences USSR

[Abstract] The phosphorus-, sulfur- and nitrogen-containing heterocycles have been little studied in comparison with phosphorus-, oxygen- and nitrogen-containing derivatives. Here the authors study the possibility of obtaining 2-substituted 4,5-benzo-1,3,2-triazaphospholanes from the reaction between derivatives of trivalent phosphorus and N-methyl-o-aminothiophenol (I). In the reaction with di- and triamides of phosphoric acid, they were able to obtain 2-substituted 3-methyl-4,5-benzo-1,3,2-thiazaphospholanes with a high yield.

USSR

UDC 542.91:547.1'118

#### DIOXAPHOSPHOLENES WITH A 3-COORDINATED PHOSPHORUS ATOM

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA KHMICHESKAYA in Russian No 12, 1976 p 3841

MUKHAMEDOV, F. S., VOLKOVA, V. N., RIZPOLOZHENSKIY, N. I., and PUDOVIK, M. A., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, and the Kazan' Branch of the Academy of Sciences USSR

[Abstract] The dioxaphospholenes by reason of their peculiar structure show a number of interesting chemical features, but up to now none of them have been studied except in the form of derivatives containing 4- or 5-coordinated phosphorus atoms, while those with the 3-coordinated atom have remained unknown. The authors show that the interaction between  $PCl_3$  or hexaethyltriamidophosphite with benzoyl leads to the production of the 2R-4,5-diphenyl-1,3,2-dioxaphospholenes (III), (IV); also that (IV) can be obtained from (III) by interaction with  $(C_2H_5)_2NH$  in the presence of  $(C_2H_5)_3N$ . Various physical constants of these new compounds were determined.

USSR

UDC 541.63:547.1'118

## THE USE OF VARIOUS PHYSICAL METHODS TO STUDY THE STERIC STRUCTURE OF DI-CHLOROMETHYLPHOSPHONIC ACID CHLORIDE

Moscow IZVESTIYA AKADEMII NAUK SSSR SERIYA KHMICHESKAYA in Russian No 12,  
Dec 76 pp 2701-2707

RAYEVSKIY, O. A., KHALITOV, F. G., MUMZHIYEVA, N. G., GILYAZOV, M. M., ZAKIROV, D. U., SAFIN, I. A., and AGANOV, A. V., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Kazan' Branch of the Academy of Sciences USSR; Kazan' Physico-Technical Institute, and Kazan' State University imeni Lenin

[Abstract] In the liquid state, in solutions, and in one of the crystalline modifications of chloromethylphosphonic acid, exists a mixture of two rotating isomers with symmetry  $C_s$  and  $C_1$  (gauche-gauche; and gauche-trans-orientation of two atoms of chlorine of the group  $CHCl_2$  with respect to the bond  $P=O$ ). In the two crystalline modifications individual conformers are stabilized. It is proposed that in the stabilization of a conformer with a gauche-transorientation of chlorine atoms, some definite contribution is made by a weak intramolecular bond of type  $C--H...O = P$ .

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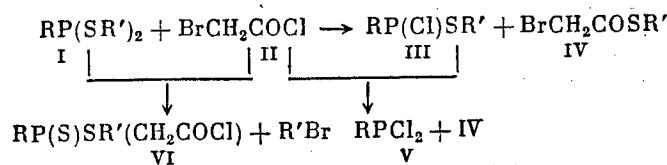
UDC 547.26'118

## REACTION OF ETHYL(PHENYL)DITHIOPHOSPHONOUS ACID ESTERS WITH BROMOACETIC ACID CHLORIDE

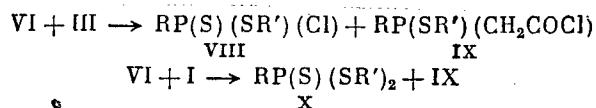
Leningrad ZHURNAL OBSHCHEY KHMII in Russian Vol 46(108), No 12, Dec 76  
pp 2748-2749 manuscript received 24 Mar 76

KRASIL'NIKOVA, YE. A., RAZUMOV, A. I., ZYKOVA, T. V., and ORLOVA, G. V.,  
Kazan' Institute of Chemical Technology imeni S. M. Kirov

[Abstract] Ethyl(phenyl)dithiophosphorous acid esters (I) containing the ambidentate group  $= \ddot{\text{P}}-\ddot{\text{S}}-$  are reacted with bromoacetic acid chloride (II) at room temperature;



$^{31}\text{P}$  NMR spectra of the reaction mixture show resonance signals corresponding to the initial acid ester (I), phenyl(S-propyl)-chlorophosphonite (III), phenyl dichlorophosphine (V) and phenyl-S-propylthiophosphinylacetic acid chloride (VI). A number of secondary processes take place in fractionation distillation. Chloride (VI) undergoes intramolecular regrouping to thioester of ethyl(phenyl)chlorothiophosphinylacetic acid  $\text{RP}(\text{S})\text{Cl}(\text{CH}_2\text{COSR}')$  (VII). The compound (VI) is also desulfonated by the initial ester (I) and chloride (III):



References 4 Russian.

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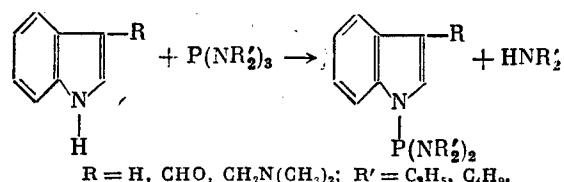
UDC 547.26'118.07

### 1-INDOLYL-AMINOPHOSPHINES

Leningrad ZHURNAL OБSHCHEY KHMII in Russian Vol 46(108), No 12, Dec 76  
p 2749 manuscript received 3 May 76

RAZUMOV, A. I., GUREVICH, P. A., and MUSLIMOV, S. A., Kazan' Institute of Chemical Technology imeni S. M. Kirov

[Abstract] Hexaalkyltriaminophosphines are reacted with indole and its derivatives.



The reaction products were identified as tetraethyldiamino-1-indolyl phosphine (yield 55%, melting point 138-140°C (decomposes)), tetraethyl-diamino-1-(3-formyl)-indolyl phosphine (yield 45%, melting point 199-200°C (decomposes)), and tetraethyldiamino-1-(3-N,N-dimethylaminomethyl)indolyl phosphine (yield 42%, melting point 170-172°C (decomposes)). References 3 Russian.

USSR

UDC 547.26'118

REACTION OF METHYL(PHENYL)DICHLOROPHOSPHITES WITH PHENYL SELENOL

Leningrad ZHURNAL OБSHCHEY KHMII in Russian Vol 46(108), No 12, Dec 76  
p 2750 manuscript received 16 May 76

KOLODIY, YA. I., L'vov State University imeni Ivan Fanko

[Abstract] An investigation of the reaction of alkyl(phenyl)-phosphorous acid chlorides with selenols shows that the final product in reactions of methyl and phenyl dichlorophosphite with phenyl selenol is triphenyl-triselenophosphate (I). The reaction takes place initially with formation of triselenophosphite (II), which is oxidized by air to form phosphate (I). The mechanism of the reaction is explained as protonation of the intermediate diselenophosphite with formation of a quasiphosphonium compound that is strongly electrophilic. Then nucleophilic substitution takes place at the phosphorus atom with phenyl selenol resulting in triselenophosphite (II). Reference 1 Western.

USSR

UDC 547.551.43'118'123

N-PHENYL-N-TETRAETHYLDIAMIDOSELENOPHORYLMETHYLCARBAMATE

Leningrad ZHURNAL OБSHCHEY KHMII in Russian Vol 46(108), No 12, Dec 76  
pp 2750-2751 manuscript received 15 Mar 76

ANDRONOV, B. F., KOLESOVA, V. A., and STREPIKHEYEV, YU. A., Moscow Institute of Chemical Technology imeni D. I. Mendeleyev

[Abstract] Sodium-N-phenylmethylcarbamate is acted on by tetraethyldiamido-selenophoric acid chloride in absolute ether to give the previously undescribed compound N-phenyl-N-tetraethyldiamido-selenophorylmethyl-carbamate (I). After boiling the reaction mixture for 10 hours and separating out the residue by centrifuging, a fraction was isolated with a boiling point of 156-166°C (0.1 mm) from which crystals are eventually isolated with melting point of 57-58°C (hexane). The structure and purity of compound (I) are verified by PMR and IR spectra. An investigation of toxicity shows that this carbamate is lethal in a dose of 50 mg/kg for rats, and ~200 mg/kg for mice. References 3 Russian.

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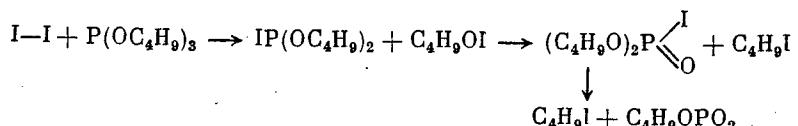
UDC 547.26'118

### REACTION OF TRIBUTYL PHOSPHITE WITH IODINE

Leningrad ZHURNAL OBSHCHEY KHMII in Russian Vol 46(108), No 12, Dec 76  
pp 2659-2662 manuscript received 13 Jun 75

AKHMETZHANOV, I. S., All-Union Scientific Research and Design Institute of Surfactants

[Abstract] It is found that tributyl phosphite reacts rapidly with iodine in ether at a low temperature (-78°C). The butyl iodide yield is about 70% with respect to the reacted iodine (per two alkyl groups). The tributyl phosphite-iodine system in ether is a fairly strong oxidizing agent at low temperature. This action is apparently due to the formation of butyl hypoiodite in the system.



Tributyl phosphite reacts with iodine in the presence of triethylamine, splitting off hydrogen iodide from the intermediate butyl hypoiodite to form triethylamine hydroiodide and butyraldehyde. References 7: 1 Russian, 6 Western.

USSR

UDC 547.26'118+546.171.8

### ON REACTIONS OF PHENYL AZIDE WITH DIALKYLTRIMETHYLSILYL PHOSPHITES

Leningrad ZHURNAL OBSHCHEY KHMII in Russian Vol 46(108), No 12, Dec 76  
pp 2662-2669 manuscript received 30 Jun 75

GAREYEV, R. D., Kazan' Veterinary Institute imeni N. E. Bauman

[Abstract] An investigation is made of reactions of phenyl azide with dialkyltrimethylsilyl phosphites. These reactions take place readily and are highly exothermic. The nature of the final product depends considerably on the reaction conditions. When phenyl azide is reacted with dimethyltrimethylsilyl phosphite at room temperature there is a gradual increase in the temperature of the reaction mixture, but liberation of nitrogen begins with some delay, the duration of this induction period being inversely dependent on the temperature of the reaction mixture. When the temperature has risen to 70-80°C the addition of each subsequent batch of phenyl

azide is accompanied by nearly instantaneous release of nitrogen and formation of dimethyl-N-trimethylsilylanylidophosphate. Under analogous conditions when phenyl azide is reacted with diethyltrimethylsilyl phosphite, diethyl-N-trimethylsilylanylidophosphate is formed. Analysis shows that the reactions take place via intermediate formation of 1-dialkoxyphosphinyl-3-trimethylsilyl-3-phenyltriazines that degrade rapidly with liberation of dialkyl-N-trimethylsilylanylidophosphates; under mild conditions and in the presence of water these inclusion complexes hydrolyze rapidly, discharging the trimethylsilyl group and forming 1-dialkoxyphosphinyl-3-phenyltriazenes. A probable mechanism is proposed for these reactions. References 15: 9 Russian, 6 Western.

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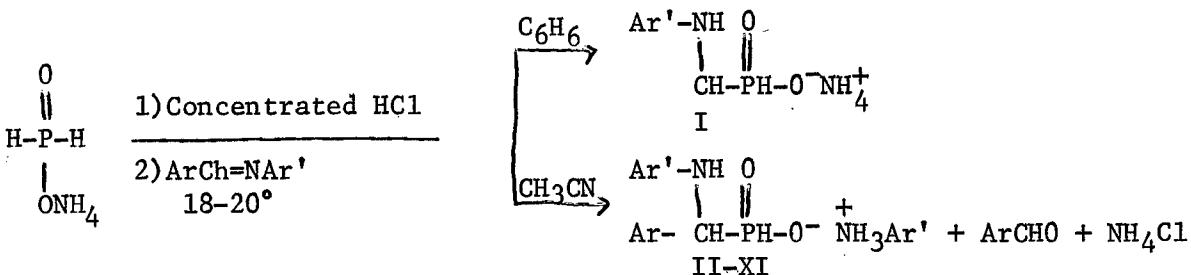
UDC 547.241

REACTIVITY OF HYPOPHOSPHITES. II. REACTION OF AMMONIUM HYPOPHOSPHITE WITH AZOMETHYNES

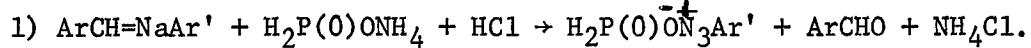
Leningrad ZHURNAL OБSHCHEY KHMII in Russian Vol 46(108), No 12, Dec 76  
pp 2669-2675 manuscript received 30 Jun 75

YUDELEVICH, V. I., SOKOLOV, L. B., and IONIN, B. I., All-Union Technological Research Institute of Antibiotics and Medicinal Enzymes, Leningrad Technological Institute imeni Lensoveta

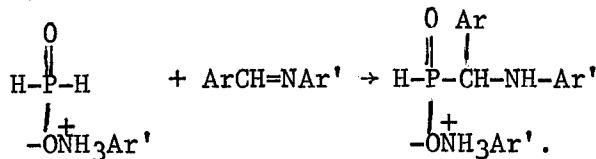
[Abstract] An investigation is made of the feasibility of using ammonium hypophosphite in reactions with azomethynes. The azomethynes could not be reacted directly with ammonium hypophosphite without using additives, and therefore the reaction was done in a solvent with the addition of hydrochloric acid. The reaction goes to almost total completion after mixing the reagents without the application of heat. Salts of N-aryl- $\alpha$ -amino-arylmethanephosphinic acid are formed, the composition of these salts depending on the solvent used. The ammonium salt is formed in benzene, and in acetonitrile the azomethyne is partially hydrolyzed and the resultant aromatic amine forms the corresponding arylammonium salt of N-aryl- $\alpha$ -aminoarylmethanephosphinic acid.



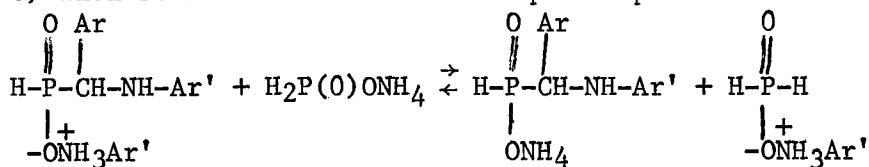
The results of experiments show that azomethynes react with ammonium hypophosphite in the following general scheme:



2) In acetonitrile and benzene:



3) When benzene is used in the aqueous phase:



The reaction takes place analogously with other azomethynes.

References 21: 8 Russian, 13 Western.

USSR

UDC 541.49+547.182.+547.241

#### STEREOCHEMISTRY OF COMPLEXES OF TIN CHLORIDE WITH PHOSPHORUS ACID CHLORIDES

Leningrad ZHURNAL OBSHCHEY KHMII in Russian Vol 46(108), No 12, Dec 76  
pp 2675-2679 manuscript received 30 Jun 75

KURAMSHIN, I. YA., ZAKIROV, D. U., SAFIN, I. A., MORATOVA, A. A., and  
PUDOVIK, A. N., Kazan' State University imeni V. I. Ul'yanov-Lenin, Kazan'  
Physicotechnical Institute, Kazan' Affiliate of the Academy of Sciences USSR

[Abstract] The  $^{35}\text{Cl}$  NQR method was used to study the geometric structure of complexes of phosphorus acid chlorides and dichlorides  $\text{RP}(\text{O})\text{Cl}_2$  ( $\text{R}=\text{CH}_3\text{O}$ ,  $\text{CH}_3$ ,  $(\text{CH}_3)_2\text{N}$ ,  $\text{ClCH}_2$ ,  $\text{Ph}$ ,  $\text{C}_2\text{H}_5$ ),  $\text{R}_2\text{P}(\text{Y})\text{Cl}$  and  $\text{R}_2\text{PCl}$  ( $\text{R}=\text{CH}_3$ ,  $\text{C}_2\text{H}_5$ ;  $\text{Y}=\text{O}$ ,  $\text{S}$ ) with tin chloride. It was found that the geometry of the  $[\text{RR}'\text{P}(\text{Y})\text{Cl}]_2\text{SnCl}_4$  complexes is determined by both steric and electronic effects of the substituent associated with the phosphorus atom. It was found that complexing reduces the ionicity of the  $\text{P}-\text{Cl}$  bond approximately linearly with decreasing frequencies of the quadrupole spectra of the chlorine nuclei associated with the tin atom. References 8 Russian.

USSR

UDC 546.185+547.26'118

REACTION OF N,N-DICHLOROALKYLAMINES WITH PHOSPHORUS TRICHLORIDE AND RED PHOSPHORUS

Leningrad ZHURNAL OBSHCHEY KHMII in Russian Vol 46(108), No 12, Dec 76  
pp 2679-2682 manuscript received 20 Mar 75

KOVENYA, V. A. and PINCHUK, A. M., Institute of Organic Chemistry,  
Academy of Sciences UkrSSR

[Abstract] Previous research describes reaction of N,N-dichloroethylamine with phosphorus trichloride with the conclusion that the reaction product is N-chloro-N-tetrachlorophosphorusethylamine  $C_2H_5N(Cl)PCl_4$ . In this paper the authors study reaction of N,N-dichloroalkylamines with phosphorus trichloride in a  $CCl_4$  solution and show that the reaction may take different paths depending on the ratio of components and the temperature. N,N-dichloroamines that contain the dichloroamino group in association with a primary or tertiary carbon atom react with phosphorus trichloride with liberation of chlorine and formation of trichlorophosphazo compounds. Intermediate reaction products are N-chloro-N-tetrachlorophosphoramines. 2-N,N-Dichloroaminonitriles react with red phosphorus to form trichlorophosphazo compounds and azoalkyls, while N,N-dichloroalkylamines interact with red phosphorus to form trichlorophosphazoalkane dimers and compounds of undetermined structure. References 9: 8 Russian, 1 Western.

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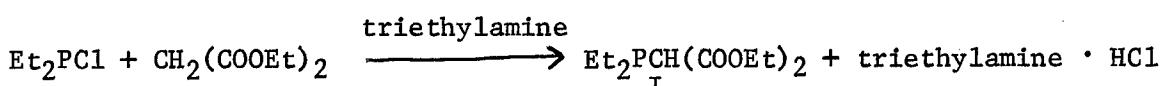
UDC 547.419.1

DIETHYL PHOSPHINE MALONIC ESTER, SYNTHESIS AND CONVERSIONS

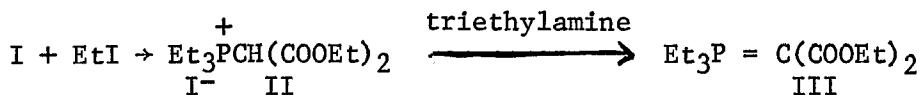
Leningrad ZHURNAL OBSHCHEY KHMII in Russian Vol 46(108), No 12, Dec 76  
pp 2683-2685 manuscript received 27 Mar 75

REPINA, L. A., LOKTIONOVA, R. A., and GOLOLOBOV, YU. G., Institute of  
Organic Chemistry, Academy of Sciences UkrSSR

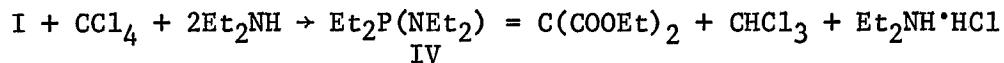
[Abstract] The paper describes the reaction of diethyl malonate with diethylchlorophosphine. In the presence of triethylamine this reaction leads to C-phosphorylated malonic ester (I).



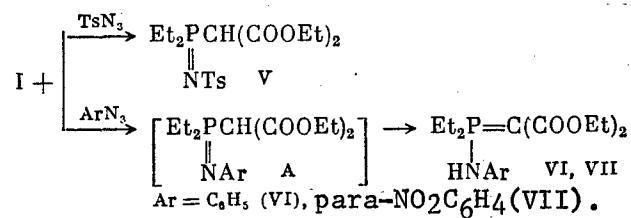
Diethoxycarbonylmethyldiethylphosphine (I) is oxidized by air with considerable evolution of heat and alkylated by alkyl iodide to phosphonium salts (II); these salts are converted by triethylamine to ylids (III).



Phosphine (I) undergoes Todd-Atterton reaction with  $\text{CCl}_4$  and amines, forming ylids (IV).



Phosphine (I) forms phosphazo compound (V) with tosylazide, corresponding to normal imination; but when arylazides (phenyl- and p-nitrophenylazides) react with phosphine (I), it is not the phosphazo compounds (A) that are formed, but their ylid isomers (VI) and (VII).



### References 6 Russian.

USSR

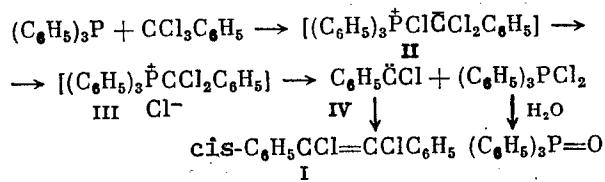
UDC 547.539.199.2+547.26'118

## REACTION OF TRIPHENYLPHOSPHORUS AND TRIALKYL PHOSPHITES WITH BENZOTRICHLORIDES

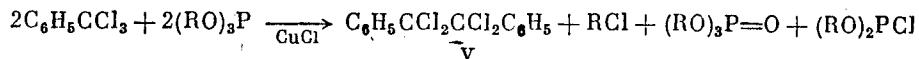
Leningrad ZHURNAL OБSHCHEY KHIМII in Russian Vol 46(108), No 12, Dec 76 pp  
2686-2689 manuscript received 20 May 75

KUKHAR', V. P. and SAGINA, YE. I., Institute of Organic Chemistry, Academy of Sciences UkrSSR

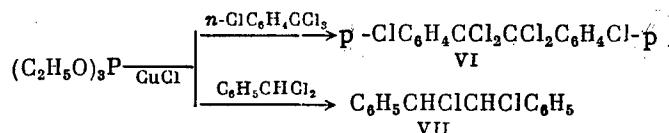
[Abstract] Triphenylphosphorus is reacted with benzotrichloride in benzene with heating to give triphenyl dichlorophosphoran and *cis*-1,2-diphenyl-1,2-dichloroethylene (I). It is probable that an ionic pair (II) is formed initially with rearrangement to phosphonium salt (III). The latter decomposes to triphenyl dichlorophosphoran and phenyl chlorocarbene (IV) which dimerizes to *cis*-diphenyldichloroethylene (I).



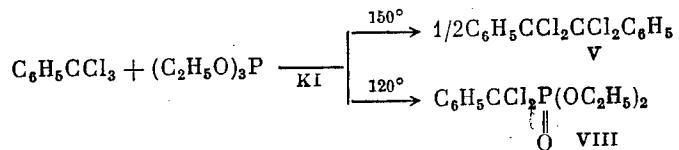
Cuprous chloride was found to catalyze the reaction of benzotrichloride with phosphites in the presence of heating to 120-140°C without a solvent. The reaction products are alkyl chloride, 1,2-diphenyl-1,1,2,2-tetrachloroethane (V) and a mixture of organophosphorus compounds, chiefly trialkyl phosphate and dialkyl chlorophosphite.



Para-chlorobenzotrichloride reacts with triethyl phosphite in the presence of cuprous chloride in an analogous way, giving 1,2-bis-(p-chlorophenyl)-1,1,2,2-tetrachloroethane (VI). Under the same conditions phosphite reacts with benzyl dichloride to give 1,2-diphenyl-1,2-dichloroethane (VII).



Potassium iodide catalysis of the reaction of benzotrichloride with triethyl phosphite without a solvent at 150°C gives compound (V), and with heating to 120°C gives diethyl  $\alpha,\alpha$ -dichlorobenzyl phosphonate (VIII).



References 13: 5 Russian, 8 Western.

USSR

UDC 547.341.07

PHOSPHORYLATION OF OLEFINS WITH TRIVALENT PHOSPHORUS ACID HALIDES UNDER THE ACTION OF PERCHLORYL FLUORIDE. V

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 46(108), No 12, Dec 76 pp 2654-2659 manuscript received 12 Jun 75

FRIDLAND, S. V., DMITRIYEVA, N. V., and SALAKHUTDINOV, R. A., Kazan' Institute of Chemical Technology imeni S. M. Kirov

[Abstract] Phenyl dichlorophosphine interacts with perchloryl fluoride to form phenylphosphonic acid chlorofluoride and dichloride. The products

of reaction of olefin, ethyl(-phenyl)-dichlorophosphine and perchloryl fluoride are ethyl(-phenyl)-phosphonic acid chlorofluorides and dichlorides, and also ethyl(-phenyl)1-alken-2-yl phosphinic acid chlorides. Interaction of olefin, diethylamidodichlorophosphite and perchloryl fluoride gives diethylamidophosphoric acid chlorofluorides, diethylamidophosphoric acid dichloride and diethylamido-1-chloro-2-alkylphosphonic acid chlorides. References 12: 9 Russian, 3 Western.

USSR

UDC 547.26'118+541.12.038.2

INFLUENCE THAT THE STRUCTURE OF PHOSPHORYL-CONTAINING COMPOUNDS HAS ON THEIR CAPACITY FOR SOLVATION OF LITHIUM AND POTASSIUM IONS FROM RESULTS OF MEASUREMENTS OF THE  $H_{\alpha}$  FUNCTION OF TERT-BUTYLATES IN TERT-BUTYL ALCOHOL

Leningrad ZHURNAL OБSHCHEY KHIМII in Russian Vol 46(108), No 12, Dec 76  
pp 2647-2654 manuscript received 24 Jun 75

OSIPENKO, N. G., PETROV, E. S., TSVETKOV, YE. N., RANNEVA, YU. I., and SHATENSHEY, A. I., Institute of Physical Chemistry imeni L. Ya. Karpov

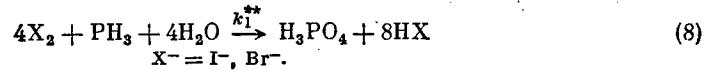
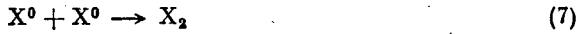
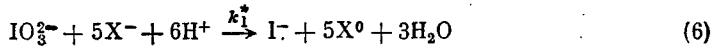
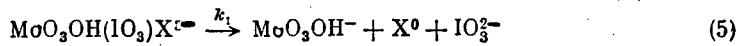
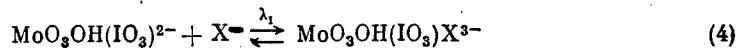
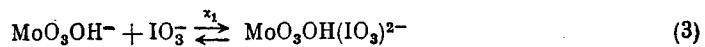
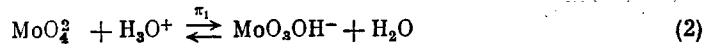
[Abstract] By using measurements of the  $H_{\alpha}$  function of solutions of tert-butyldates of lithium and potassium in tert-butyl alcohol (by the method of additives) the authors study the influence of substituents associated with the phosphorus atom on the capacity of a number of phosphoryl-containing compounds for solvation of lithium and potassium cations; the dielectric constants of some liquid compounds are measured. The solvation capacity of the investigated compounds increases most noticeably with a reduction in the degree of screening by substituents of the phosphoryl group--the main center of solvation--and also with the appearance of additional solvation centers in the molecule (polydentate configuration) when alkoxyethyl and polyoxaalkyl groups are introduced. The polydentate effect, which is especially noticeable in solvation of the potassium cation, becomes stronger with increasing distance between the oxygen atom of the substituent and the phosphoryl group. Liquid phosphine oxides containing one methyl and two polyoxaalkyl groups as substituents are superior in solvation properties to a number of dipolar aprotic solvents (hexamethanol, dimethyl sulfoxide, etc.). The value of the  $H_{\alpha}$  function of a potassium tert-butyldate solution (0.14 M) is 2.2 logarithmic units greater than that of a lithium tert-butyldate solution of the same concentration; this difference decreases appreciably or even disappears with the addition of a solvation agent (3.4 mol.%) of the investigated compounds. References 20: 16 Russian, 4 Western.

## MOLYBDENUM (VI) CATALYZED REDUCTION OF IODATE ION WITH PHOSPHINE

Leningrad ZHURNAL OБSHCHEY KHMII in Russian Vol 46(108), No 12, Dec 76  
pp 2643-2646 manuscript received 29 Apr 75

DORFMAN, YA. A., RAKITSKAYA, T. L., and KAYDAROVA, R. K., Institute of Organic Catalysis and Electrochemistry, Academy of Sciences Kazakh SSR

[Abstract] The authors study the kinetics and mechanism of catalytic reduction of iodine (V) with phosphine. The experiments were done in a thermostatically controlled zero-gradient reaction vessel equipped for studying the reaction rate with respect to potential change. The process of iodine (V) reduction with phosphine is accelerated by the iodide ion reaction product, and therefore the kinetic curves pass through a maximum. Kinetic and potentiometric curves for reduction of iodine (V) with phosphine using different concentrations of molybdenum (VI) as catalyst show an induction period during which phosphine is not oxidized at all. The reaction rate and duration of the induction period are related to the composition of the solution. As the concentration of catalyst increases from  $10^{-7}$  to  $10^{-4}$  mole/Z there is an increase in the reaction rate and a reduction in the length of the induction period. At Mo(VI) concentrations above  $10^{-4}$  mol/Z the rate of oxidation of phosphine by iodine (V) decreases and the length of the induction period increases. At a catalyst concentration of  $10^{-2}$  mol/Z no phosphine oxidation is observed for 2 hours. This indicates that dimer forms of molybdenum (VI) are inactive in the reaction  $3\text{PH}_3 + 4\text{IO}_3^- \rightarrow 3\text{H}_3\text{PO}_4 + 4\text{I}^-$ . The following catalytic reduction mechanism is proposed:



References 10: 8 Russian, 2 Western.

USSR

UDC 541.11:542.952.1:547.1'118

THERMAL REGROUPING OF TRIMETHYLSILYL METHYL ESTERS OF PHOSPHORUS ACIDS

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA KHIMICHESKAYA in Russian No. 9  
Sep 76 p. 2141 manuscript received 11 May 76

ZAKHAROV, L.S., DROZDOVA, T.D., SVOREN', V.A., KABACHNIK, M.I., Institute of  
Hetero-Organic Compounds, Acad. Sci. USSR

[Abstract] When trimethylsilylmethyldichlorophosphate is heated to 175-200 C, thermal regrouping of the trimethylsilylmethyl group into a dimethylethylsilyl group occurs. The authors have discovered that this regrouping is general in nature and also occurs in the case of intermediate phosphates. Tris(trimethylsilylmethyl)phosphate is not thermally stable and undergoes significant changes at 200 C. Changes in the PMR spectra upon pyrolysis are reported, indicating that all three possible products of regrouping are formed. Similar regrouping is observed for diphenyl(trimethylsilylmethyl)phosphate, phenylbis(trimethylsilylmethyl)phosphate, neopentylbis(trimethylsilylmethyl)phosphate and dineopentyl(trimethylsilylmethyl)phosphate. 2 references.

USSR

UDC 541.57:547.558.1:541.49:546.98

BREAKING OF THE C-P BOND IN TRIPHENYLPHOSPHINE IN THE COMPLEX  $(PPh_3)_2PdO_2$

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA KHIMICHESKAYA in Russian No. 9,  
Sep 76 p. 2150 manuscript received 16 Jun 76

BERENBLYUM, A.S., LAKHMAN, L.I., BRODSKIY, Ye.S., ZOLOTUKHIN, V.Ye., MOISEYEV, I.I.,  
Institute of General and Inorganic Chemistry imeni N.S. Kurnakov, Acad. Sci. USSR,  
Moscow, All-Union Scientific Research Institute for Petroleum Processing,  
Elektrogorsk Affiliate

[Abstract] No known reaction of  $(PPh_3)_2PdO_2$  (I) involves the C-P bond of the coordinated  $PPh_3$ . The authors found that (I), when dissolved in benzene or DMPA, is converted into new compounds containing OPh instead of  $O_2$ . A polymer with the composition  $PPh_3(OPh)_2Pd[Pd(OPh)_2]_{20}Pd(OPh)_2PPh_3$  (II) is produced from a benzene solution of I. Pyrolysis of II forms PhOH, confirming the presence of the Pd-OPh fragment. The data produced indicate that (I) when dissolved undergoes conversion leading to oxidation of the phosphine ligand with breakage of the C-P bond. 3 references.

USSR

UDC 543.51:547.1'118:547.1'127

MASS SPECTROMETRY OF NEGATIVE IONS OF CERTAIN ORGANOPHOSPHORUS AND ORGANOBORON COMPOUNDS

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA KHIMICHESKAYA in Russian No. 9, Sep 76 pp 2127-2129 manuscript received 4 Mar 76

FURLEI, I.I., DZHEMILEV, U.M., KHVOSTENKO, V.I., TOLSTIKOV, G.A., Institute of Chemistry, Bashkir Affiliate of Acad. Sci. USSR, Ufa

[Abstract] In order to study the process of dissociative capture of electrons by molecules of organophosphorus compounds, the authors measured the mass spectra of negative ions of the following substances: tributylphosphine, triphenylphosphine, phenyldichlorophosphine, O,O-di-(menthyl-3)-phenylphosphonite, triethylphosphite, tri-( $\beta$ -ethoxyethyl)-phosphite, triphenylphosphite and di(menthyl-3)-phenylphosphite. The ions upon electron capture are formed in the excited state. The vibrational degrees of freedom are not equivalent in the redistribution of excess energy in these ions. 5 references.

USSR

UDC 542.91:547.1'118

TETRAMETHYL PHOSPHONOMALONATE

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA KHIMICHESKAYA in Russian No. 9, Sep 76 pp 2139-2140 manuscript received 11 Feb 76

ARBUZOV, B.A., SAKHIBULLINA, V.G., POLEZHAYEVA, N.A., VINOGRADOVA, V.S., Chemical Institute imeni A.M. Butlerov, Kazan' State University

[Abstract] Continuing their study of the acylation of  $\beta$ -dicarbonyl and  $\beta$ -keto-phosphone compounds, the authors synthesized tetramethylphosphonomalonate by interacting the Na derivative of phosphonoacetic ether with methylchloroformate. The problem of the possibility of keto-enol tautomerism in the phosphonomalonate was studied. It was concluded that acylation of tetramethylphosphonoacetate with methylchloroformate produces tetramethylphosphonomalonate. The IR, UV and NMR spectra were studied. Tetramethylphosphonomalonate contains significant quantities of the ionized form in dilute solutions in methanol and in water. 8 references.

Pesticides

USSR

UDC 633.88:632.934:615.285.7

HERBICIDES AND OPTIMIZATION OF THE METHODS OF MEDICINAL CROP CULTIVATION

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 10, No 12, Dec 76  
pp 78-82

VEKSHIN, B. S., All-Union Scientific-Research Institute of Medicinals,  
Moskovskaya Oblast

[Abstract] Depending on the year of cultivation, the use of herbicides has a variable effect on yield. In 1974, for example, positive results were obtained by the application of "maloran" and "patoblan" (increases of yield by 46% and 55%, respectively). The next year only "patoblan" failed to harm the medicinal crop--all the others produced drops of 33-56% in (ordinary sowing), and 28-51% (solid-row sowing). This is explained by the unevenness of maturation of the young plants. Results of variation in sowing methods (wide-row as opposed to continuous-row) are given for 1973, 1974 and 1975. Several herbicides are considered--"maloran," "gezagard," "linuron" and "patoblan." The ripple-seed plantain and the matricary were the two herbs included in the study.

USSR

UDC 633.88:582.962]:632.934.1:615.285.7

VALUE OF HERBICIDES FOR USE WITH THE RIPPLE-SEED PLANTAIN (PLANTAGO MAJOR) CROP

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 10, No 12, Dec 76  
pp 82-85

BUKINA, N. V., VEKSHIN, B. S., PUSHKINA, G. P., and DODOTCHENKO, M. V., All-Union Scientific-Research Institute of Medicinals, Moskovskaya Oblast

[Abstract] Extensive tests were run on the use of a number of herbicides and combinations thereof, during 1972-1975, on the ripple-seed plantain (this is a valuable medicinal plant, useful as an astringent, styptic and healing agent, and applied in the healing of gastric and duodenal ulcers), whose output is a long way from satisfying current medical needs. An estimated increase of more than 100% is planned by 1980. Since the greatest impediment to realizing a good crop is found in pests, great stress is being laid on the study of herbicides. On the pesticides studied during this period, the best results were obtained from the commerical pesticide "kotoran," whose active ingredient is fluomethrone. This pesticide successfully passed its "production" tests, and has been recommended (1973) by the State Commission on Chemical Agents, USSR Ministry of Agriculture, for routine use on plantain fields.

USSR

SUBSTANCE FOR INCREASING THE YIELD AND SUGAR CONTENT OF SUGAR BEETS

USSR AUTHOR'S CERTIFICATE No 444532, FILED 21/02/72, PUBLISHED 25/09/75  
in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No 21, 1976 Abstract No 210336P by  
T. Ya. Ogibina]

VLASYUK, P. A., PRIKHOD'KO, N. V., BORISYUK, V. A., BYSTRYY, V. A.,  
KUSHITSKIY, M. F., and ZUB, M. P.

[Text] The use of the aqueous solution of DMSP has been proposed as a growth substance. Sugar beets are sprayed twice at an interval of 10-25 days during the period of intensive growth using a 5-7.5% solution and during the preharvest period using 2.5-5%. The consumption of the preparation per single spraying using 2.5-5-7.5% solution was 10-20-30 kg/hectare respectively. The use of DMSO leads to increased harvest by 30-40 hundred weights per hectare and 0.2-1.2% increased sugar content. The collection of sugar increases by 5.2-13 hundred-weights per hectare.

USSR

RETARDANT COMPOSITION

USSR AUTHOR'S CERTIFICATE No 487626, FILED 25/03/74, PUBLISHED 06/02/76  
in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No 21, 1976 Abstract No 210314P by  
T. Ya. Ogibina]

RADTSEVA, G. YE., GIRFANOV, V. K., and RADTSEV, V. S., Institute of Biology, Bashkir Branch of the Academy of Sciences USSR

[Text] A retardant composition has been proposed based on (2-chloroethyl)-trimethylammonium chloride (I). To intensify the ability of plants to resist succumbing to various agents, an agent was introduced, capable of activising physiological processes during the vegetation period of such plants, an hormonal agent -- ethyl-N-benzoyl-(3-4-dichlorophenyl)-2-aminopropionate (II). ("Suffix") in weight ratios of I:II being 2:0.5 to 4-0.5. Laboratory and field experimental results are reported using the winter rye as an experimental subject.

USSR

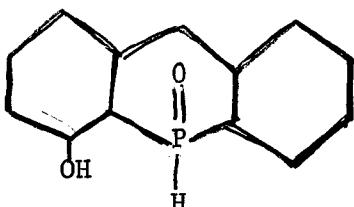
METHOD FOR PREPARATION OF 10-Oxo-4a-HYDROXY-10-PHOSPHAPERHYDROANTHRACENE

USSR AUTHOR'S CERTIFICATE No 445760, FILED 12/03/73, PUBLISHED 19/12/75  
in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No 21, 1976 Abstract No 210294P by  
T. I. Bobrova]

VYSOTSKIY, V. I., PAVLYCHEVA, E. V., and TILICHENKO, M. N.

[Text] 10-Oxo-4-hydroxy-10-phosphaperhydroanthracene with the formula



was obtained by the reaction of 2,2-methylenebiscyclohexanone (II) with phosphine in presence of HCl in organic solvent (dioxane) at 50-60°. Example. To a solution of 20.8 g II in 150 ml dioxane, 20.5 g of Mg<sub>3</sub>P<sub>2</sub> was added with cooling in an atmosphere of Ar followed by 150 ml HCl in portions of 60, 60 and 30 ml at a temperature below 50°, the mixture is stirred for 20-30 min (the temperature raising to 57°), stirred for another 30-40 min at that temperature, then for 2 more hours at about 20°, heated to 90°, cooled, diluted with 300 ml of distilled water, extracted with 300-400 ml CHCl<sub>3</sub>, the extract was evaporated in vacuum to about 1/3 volume and cooled to yield 14 g of I, m.p. 188-190° (from cyclohexane) 57.5%. To prove the structure, to a solution of 2.42 gm of I in 30 ml of refluxing MeOH, 20 ml of 30% H<sub>2</sub>O<sub>2</sub> was added, refluxed for 3 hrs, evaporated in 15 ml vacuum, the residue was cooled, filtered, to yield 1.8 g of the corresponding phosphinic acid, m. p. 251.0-251.5° (from alcohol-water solution of 1:7) in 70% yield. IR-spectral data have been reported; I can be used as a bactericide.

USSR

METHOD FOR PREPARATION OF RHODANINE-4-THIONE-3-ALKYLCARBOXYLIC ACID

USSR AUTHOR'S CERTIFICATE No 455107, FILED 02/01/73, PUBLISHED 29/09/75  
in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No 21, 1976 Abstract No 210290P by  
T. I. Bobrova]

GANITKEVICH, M. I., Lvov Polytechnical Institute

[Text] Example. To a solution of 5.74 g of rhodanine-3-acetic acid in 45 ml dioxane, 2.3 g of  $P_2S_5$  was added, refluxed for 1.5 hrs, activated carbon was added, refluxed for 5 hrs., filtered, evaporated, to yield 4.8 g rhodanine-4-thione-3-acetic acid (I) in 77%. Condensation of I with 0.005 mole of  $4-C_1C_6H_4CHO$  in 5 ml glacial AcOH and 0.5 g of molten AcONA at  $60^\circ$  yields 1.35 g of rhodanine-5-p-chlorobenzylidene-4-thione-3-acetic acid, m.p.  $254-255^\circ$ , the yield -- 82%.

USSR

FUNGICIDAL AND ANTISEPTIC PROPERTIES OF PHENATSIZOLE

KHIM. SREDSTVA ZASHCHITY RAST. (Chemical Plant Protective Agents) in Russian No 6, Moscow 1976 pp 80-86

[From REFERATIVNYY ZHURNAL, KHIMIYA No 21, 1976 Abstract No 210275  
author's Abstract]

SANIN, M. A., ABELENTSEV, V. I., GOLYSHIN, N. M., and MONOVA, V. I.

[Text] The fungicidal and antiseptic activity of phenatsizole (I) has been investigated. At a concentration of 0.5% I shows high effectiveness in controlling grape's gray mould. In respect to its activity I is equal to benlat and euparene; it does not lower the quantity nor the degree of ripening of grapes. In concentrations of 0.025, 0.012 and 0.006% I exhibited high protective action in controlling powdery mellow of cucumbers. In this respect I is comparable to benlat and surpasses caratan. This preparation shows remarkable systemic action against the powdery mellow of cucumbers upon introduction into the soil. The preparation I is effective against powdery mellow of wheat used at the concentrations of 0.05% and against black currant at concentrations of 0.05 and 0.025%. The specificity of sensitivity of various test-objects towards I, the protective concentrations for the tissue, natural and synthetic skin have been determined for I.

USSR

METHOD FOR PREPARATION OF MIXED ESTERS OF CYCLOPROPANE CARBOXYLIC ACIDS

USSR AUTHOR'S CERTIFICATE No 322986, FILED 28/09/70, No 1482529, PUBLISHED 05/04/76 in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No 21, 1976 Abstract No 210245 by T. Ya. Ogibina]

KUZNETSOV, N. V., and MYRSINA, R. A., Institute of Organic Chemistry Academy of Sciences USSR

[Text] A mixture of 0.1 mole of cyclopropanecarboxylic acid (I), 12 ml MeOH, 30 ml CC<sub>14</sub> and 0.05 g p-MeC<sub>6</sub>H<sub>4</sub>SO<sub>3</sub>H are refluxed for 10 hrs, to yield 7 g ME of I, b. p. 117-18°/755,  $n_D^{17}$  1.4200. Analogously the butyl ester of I was obtained in 70% yield, b.p. 72-73/16,  $n_D^{20}$  1.4290. The EE, amyl, allyl, and propargyl ethers of I have been obtained in yields of 60, 70, 72 and 50% respectively.

USSR

METHOD FOR PREPARATION OF DIMETHYLCHLOROMETHYL PHOSPHINE OXIDES

USSR AUTHOR'S CERTIFICATE No 455971, FILED 21/06/73, PUBLISHED 16/01/76 in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No 21, 1976 Abstract No 210243P by T. Ya. Ogibina]

ZIMIN, V. M., ZHUK, R. V., and GLADSHTEYN, B. M.

[Text] Compounds with the general formula (Me)<sub>2</sub>P(O)CH<sub>2</sub>Cl (I) may be used as an extracting agent and in synthesis of insecticides. Example. Into a solution of 12.4 g of dimethylchlorophosphine in C<sub>6</sub>H<sub>6</sub> monomer formaldehyde is passed in, obtained by depolimerization of paraform, until the reaction temperature starts dropping. C<sub>6</sub>H<sub>6</sub> is removed in vacuum, the residue is distilled to yield 14.5 g I, C<sub>3</sub>H<sub>8</sub>ClPO, with a b.p. 89-91°1-2, m.p. 68-69°.

USSR

METHOD FOR PREPARATION OF TRICHLOROACETOXYETHYLTRITHIOL PHOSPHATES

USSR AUTHOR'S CERTIFICATE No 453411, FILED 21/05/73, PUBLISHED 10/09/75  
in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No 21, 1976 Abstract No 210238 by  
B. Ya. Chvertkin]

STREL'TSOV, R. V., KIRILINA, L. E., SHINKINA, I. I., and BLIZNYUK, N. K.

[Text] Compounds of the general formula  $\text{Cl}_3\text{CC(O)OCH}_2\text{CH}_2\text{SP(O)(SR}_2)$  (I) ( $\text{R} = \text{alkyl, aryl, aralkyl}$ ) have been obtained by the reaction of  $\beta$ -trichloroacetoxyethylsulphenchloride (II) with diorganodithiochlorophosphites and glacial AcOH at a temperature of  $-40^\circ$  in an inert organic solvent. Example. A mixture of 0.02 mole of dibutyldithiochlorophosphite and 0.02 mole of glacial AcOH in 25 ml  $\text{CHCl}_3$  were cooled to the temperature of  $-40^\circ$  and the solution of 0.02 mole of II in 10 ml  $\text{CHCl}_3$  was added. The solution of II is prepared by adding of 0.02 mole of  $\text{SO}_2\text{Cl}_2$  or  $\text{Cl}_2$  to the solution of 0.02 mole of  $\beta$ -mercaptoethyl ester of the trichloroacetic acid in  $\text{CHCl}_3$  at the temperature of  $-35^\circ$  with gradual increase of the temperature to  $20^\circ$ . After the addition of the solution of II the reaction temperature is increased to  $20^\circ$  in 2-2.5 hrs., then it is stirred for one hr, evaporated, to yield I ( $\text{R} = \text{Bu}$ ),  $n_{\text{D}}^{20}$  1.5250  $d_4^{20}$  1.2960. Analogously other I were obtained ( $\text{R}$ ,  $n_{\text{D}}^{20}$ ,  $d_4^{20}$  being reported): Et, 1.5460, 1.4470, Pr, 1.5830, 1.3681;  $\text{C}_5\text{H}_{11}$ , 1.5235, 1.2790;  $\text{C}_6\text{H}_{13}$ , 1.5120, 1.2630;  $\text{C}_8\text{H}_{17}$ , 1.5060, 1.1861;  $\text{PhCH}_2$ , 1.5930, 1.3580; Ph, 1.5900, 1.4090.

USSR

METHOD FOR PREPARATION OF ALKYL-SUBSTITUTED PHENYLDICHLOROPHOSPHITES

USSR AUTHOR'S CERTIFICATE No 488822, FILED 13/06/74, PUBLISHED 24/08/75  
in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No 21, 1976 Abstract No 210230 by  
T. U. Bobrova]

BLIZNYUK, N. K., KLIMOVA, T. A., PROTASOVA, L. D.

[Text] Compounds with the general formula  $\text{R}_n\text{C}_6\text{H}_{5-n}\text{OPCl}_2$  (I) ( $\text{R} = \text{alkyl}$ ) are obtained by the reaction of  $\text{PCl}_3$  (II) with  $(\text{R}_n\text{C}_6\text{H}_{5-n}\text{O})_3\text{P}$  (III) keeping the ratio of II:III 3-5:1 at  $150-300^\circ$ . Example. A mixture of 0.06 mole III ( $\text{R}_n = 3\text{-Me}$ ) and 0.54 mole II is heated for 2 hrs at  $200-220^\circ$  in an autoclave, excess II is evaporated, the residue is distilled to yield

I ( $R_n = 3\text{-Me}$ ), the yield 94%, b.p.  $121\text{-}122^\circ/20$ ,  $n_D^{20} 1.5535$ ,  $d_4^{20} 1.3126$ . Analogously other I are obtained ( $R_n$ , yield in %, b.p. in  $^\circ\text{C}$  and/or  $n_D^{20}$ ,  $d_4^{20}$  being reported): 4-Me, 96, 121-122, 1.5545, 1,3084; 3,4-Me<sub>2</sub>, 89, 1.5568, 1.2795.

Pharmacology and Toxicology

USSR

UDC 678.746.22:541.697

HYGIENIC CHEMICAL PROPERTIES OF MSN-1 COPOLYMER

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 p 40 manuscript  
received 14 Jul 76

ROTBENBERG, V. V., MAKSIMOVA, N. S. and GURICHEVA, Z. G.

[Abstract] The article gives the results of a study of migration of monomers (styrene, methyl methacrylate, acrylonitrile) into water and media simulating food products from MSN-1 plastic, a styrene copolymer. Tests were also done on possible air contamination by MSN-1. Organoleptic properties of water are slightly affected by contact with the plastic. No migration or air contamination by styrene or acrylonitrile was detected. Migration of methyl methacrylate into stored products was less than the permissible maximum concentration, and no air contamination by the monomer was detectable. The copolymer is recommended for use in items that come into contact with food and medicines, and for making toys.

References 1 Russian.

USSR

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TOXIC PROPERTIES OF A NUMBER OF PLASTIC STABILIZERS

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 p 41 manuscript  
received 14 Jul 76

MIKHAYLETS, I. B.

[Abstract] The author considers the toxicity of eight plastic stabilizers: benzene OA, 2-hydroxy-4-propoxyphenylthenoyl ketone, Tinuvin 326, S-67, 2,2'-thiobis(4-methyl-6-isobornylphenol), 2,4,6-tritert-butylphenyl ester of salicylphosphorous acid, 3,3'-thiodipropionate dialkyl and dialkylthiodivalreiate. Acute, repeated and chronic tests were done on white mice, rats and guinea pigs. None of the antioxidants studied induced sensitization in the animals; all are practically nontoxic. Thiodipropionate, thiodivaleriate, S-67, tritert-butylphenyl ester of salicylphosphorous acid, Tinuvin 326 and 2,2-thiobis(4-methyl-6-isobornyl)phenol are recommended for stabilizing plastics that come into contact with drinking water, food products, cosmetics and medicines and for making toys. The other three stabilizers are approved for use in plastics that come into contact with food products and for making toys.

USSR

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HYGIENIC PROPERTIES OF POLY-4-METHYLPENTENE-1

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 p 42 manuscript  
received 14 Jul 76

KOMAROVA, YE. N. and BOYKOVA, Z. K.

[Abstract] Hygienic chemical analysis and organoleptic studies were done on poly-4-methylpentene-1 (P-4-MP-1) to determine the suitability of this polyolefin for food packaging. Migration of low-molecular toxins into milk and water extracts was studied, and also the biological activity of the compound on experimental animals. Organoleptic properties of drinking water and milk in contact with P-4-MP-1 were unchanged by contact with the plastic. The extracts were found to be biologically inactive in various kinds of tests. The plastic is recommended for storing food products at 20-80°C.

USSR

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HYGIENIC PROPERTIES OF FTORLON-1 COATINGS

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 pp 44-45 manuscript  
received 16 Jul 76

GURICHEVA, Z. G., KRYNSKAYA, I. L., and SHAULOVA, N. S.

[Abstract] Tests are done to determine the suitability of F-1 ftorlon [a fluorocarbon plastic] as a coating for lining food cans. Aluminum plates were coated with a plastic film by immersion in a suspension of F-1 in acetone + dimethyl phthalate. Exhaustive organoleptic and hygienic tests on plates and cans showed satisfactory results. Toxicological studies on experimental animals revealed very slight physiological shifts of uncertain nature, qualified as "threshold effects." The animals were given water and oil extracts of the plastic daily for half their lives (1 year), and it is assumed that people will not be consuming canned products exclusively for such a long period. The plastic is therefore recommended for use in contact with canned food products. References 3 Russian.

USSR

UDC 678.04:678.743.22-19:541.697

TOXICITY OF SOME STABILIZERS OF PVC COMPOSITIONS

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 p 45

KRYNSKAYA, I. L., YEVSYUKOV, V. I., and MAKSIMOVA, N. S.

[Abstract] Toxicity studies are done on complex stabilizers (A, DP-4 and V-94) used in plastics based on PVC. The experiments were done on white mice, rats and guinea pigs. It was found that V-94 is low in toxicity, while a mixture of A and DP-4 in a ratio of 0.5:2.5 is toxic. DP-4 migrates as a complex stabilizer from PVC + ABS into packaged goods either in trace amounts or not at all. The stabilizing complex A + DP-4 is recommended for use in PVC + ABS plastic wrapping of throwaway consumer goods. V-94 can be used for wrapping dry and particulate food products.

USSR

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HYGIENIC PROPERTIES OF FTORLON CONTAINERS FOR STORAGE OF DRINKING WATER

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 p 46 manuscript received 14 Jul 76

BARAKOVA, N. V., GURICHEVA, Z. G., and SHAULOVA, N. S.

[Abstract] A report on studies of the hygienic properties of F-30 ftorlon [a fluorocarbon plastic] extruded into water containers. Organoleptic tests show satisfactory results, and no detectable migration of organofluorine compounds into stored drinking water is observed. F-30 containers are recommended for long-term storage of water. References 2 Russian.

USSR

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TOXIC PROPERTIES OF DYES FOR POLYSTYRENES AND POLYOLEFINS

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 p 47 manuscript received 14 Jul 76

PUTILINA, L. V., and YEVSYUKOV, V. I.

[Abstract] A report on tests of the toxic properties of phthalocyanin green (PZF), pigment yellow 123 (PZh123) and anthraquinone violet (PFA)

used as colorants for polystyrenes and polyolefins. Acute, repeated and chronic experiments were done on white mice and rats. The irritative and sensitizing action of the dyes was studied by skin applications. Administration of PZF and PZh123 in a single dose of 5-10 g/kg caused functional disorders of the kidneys and liver. The toxic properties of dyed plastic articles depend on the amount of pigment. Permissible amounts of migration for human safety are set at 0.12 mg per liter for PZF and PZh123. Continued action of small doses of PFA causes changes in the functional state of the liver, the reaction of the pituitary-adrenal system and functions of the enterochromaffinic cells of the intestine, and also damages the kidneys. This dye should be used in plastics only for technical purposes.

USSR

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TOXICOLOGY OF COPOLYMERS OF VINYL ACETATE + N-VINYL-2-PYRROLIDONE

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 p 48 manuscript received 14 Jul 76

BROYTMAN, A. YA., deceased, PUTILINA, L. V., and PODVAL'NAYA, YE. K.

[Abstract] An investigation was made of the toxic properties of copolymers of vinyl acetate (VA) + N-vinyl-2-pyrrolidone (VP) synthesized by radical polymerization in ethyl alcohol at 70°C with subsequent precipitation in water. Acute and chronic experiments were done on white mice and rats. The binary copolymer VA + VP was found to be nontoxic. A ternary copolymer in which the elastic properties are improved by adding vinyl n-butyl ether is characterized by mild toxic action. The composition of the binary polymer (in parts by weight) is 90 VA + 10 VP; the composition of the ternary copolymer is 82 VA + 10 VP + 8 VBE.

USSR

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HYGIENIC PROPERTIES OF FTORLON NO-STICK FINISH

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 p 38 manuscript received 12 Jul 76

KRYNSKAYA, I. L., and SUKHAREVA, L. V.

[Abstract] Organoleptic and hygienic chemical studies are done on F-4D ftorlon no-stick cookware finish. The results showed no migration of compounds containing the C-F group into products heated in cooking utensils coated with F-4D. The organoleptic properties of water and

milk were unchanged by boiling in coated pots. White rats and mice fed for 11 months with food prepared in F-4D coated utensils showed no ill effects. Experiments were also done on possible toxicity of the burned coating after handling under the most unfavorable conditions. Animals exposed to acute poisoning by the burned coating showed no toxic effects after 3 weeks.

USSR

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HYGIENIC PROPERTIES OF AN AQUACE DISPERSION FOR COATING HARD CHEESE

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 pp 37-38 manuscript received 12 Jul 76

MAKSIMOVA, N. S. and MIKHAYLETS, I. B.

[Abstract] A report on the hygienic properties of an Aquace dispersion containing 70 mol.% vinyl acetate and 30% ethylene for preventing drying and spoilage of cheese while it is ripening. The coatings are colored with approved pigments: PKS medium cadmium yellow, PZF phthalocyanine green [Pigment Green 7] and lake red ZhB. It was found that vinyl acetate does not migrate into the cheese from undyed Aquace coatings, and then the pigments have a detrimental effect on the hygienic properties of the coating. Experiments on white mice and rats showed that Aquace is practically nontoxic, and the dispersion can be recommended for coating hard cheese.

References 2 Russian.

USSR

UDC 678.746.22-416-405:541.697

HYGIENIC CHEMICAL PROPERTIES OF POLYSTYRENE FOAM FILM

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 p 36 manuscript received 12 Jul 76

GURICHEVA, Z. G., BARAKOVA, N. V., and SHAULOVA, N. S.

[Abstract] Experiments were done to determine the danger of styrene migration into liquid and solid food products from foam polystyrene film wrappers, as well as the possibility of styrene contamination of room air by polystyrene film wall covering, tree ornaments and packaging. The results showed that even when the residual monomer content is minute, foam polystyrene film should not be used for food packaging, wall covering or tree ornaments. Efforts to improve the quality of the film by doubling

with polyethylene in the melt at 250-270°C were unsuccessful; the styrene migrates through cracks and tears in the doubling layer. However, the laminated films do show reduced migration of styrene and cessation of ethylbenzene migration. It is suggested that application of a doubling layer at low temperatures may result in laminated polystyrene films with better hygienic properties.

USSR

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#### TOXICITY OF ORGANOTIN AND CADMIUM STABILIZERS

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 pp 33-34 manuscript received 15 Jul 76

MAKSIMOVA, N. S., KRYNSKAYA, I. L., and YEVSYUKOV, V. I.

[Abstract] Toxicity studies were done on cadmium stearate, dibutyltin dilaurate and dibutyltin sulfide in acute and repeated experiments and with application to the skin of the experimental animals. In addition, migration of these compounds as stabilizers in PVC + ABC plastics was studied for storage of various media in plastic containers. The results show that precautionary measures should be taken in handling cadmium stearate because of its toxicity; however, cadmium stabilizers do not migrate into oil, and therefore they can be recommended as additives for PVC + ABS plastics to be used in packaging fats. Because of pronounced toxicity and tendency to migrate into different contacting media, dibutyltin dilaurate and sulfide cannot be recommended as stabilizers for polymer materials to be used in making toys and items in contact with food, water, cosmetics and medicines. When handling organotin stabilizers consideration should be taken of their irritative action on the skin and mucous membranes. References 2 Russian.

USSR

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#### POSSIBILITY OF USING ABS PLASTICS IN CONTACT WITH FOOD PRODUCTS

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 pp 31-32 manuscript received 12 Jul 76

PETROVA, L. I., and BOYKOVA, Z. K.

[Abstract] Hygienic chemical tests were done on different ABS resins used for plastics in contact with food products: ABS-2020, ABS-1106E and SNP.

The organoleptic characteristics of the materials were studied as well as migration of styrene and acrylonitrile into stored products. It was found that lauryl mercaptan in amounts greater than 0.4% imparts an unpleasant taste and smell to drinking water. Of the three grades studied, SNP and ABS-1106E have the most satisfactory hygienic properties. SNP is recommended for parts of milking machines that come into contact repeatedly with milk. References 4 Russian.

USSR

UDC 678.04:541.697

#### TOXIC PROPERTIES OF SOME ADDITIVES FOR PLASTICS

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 pp 30-31 manuscript received 15 Jul 76

KOMAROVA, YE. N.

[Abstract] Studies were made on the toxic properties of plasticizers (di[2-ethylhexyl] phthalate, dibutyl sebacate and butyl stearate) and lubricants (stearic acid, zinc stearate and calcium stearate). Acute, repeated and chronic experiments were done on experimental animals, and in addition to plasticizers were tested by application to the skin of the animals. The results showed that these plastic additives are practically nontoxic and have no cumulative effect. It is concluded that these chemicals can be used in plastics that come into contact with food and also for making toys. References 5 Russian.

USSR

UDC 678.743.22-19:541.697

#### HYGIENIC PROPERTIES OF A PVC + ABS COMPOSITION MATERIAL

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 p 29 manuscript received 15 Jul 76

KOMAROVA, YE. N., and MAKSIMOVA, N. S.

[Abstract] A study was made of the migration of chemical substances from containers made of PVC + ABC composition material into stored products -- deodorized sunflower oil, distilled water, 40% ethyl alcohol and 9% acetic acid. It was found that packaging made from PVC and ABS resin stabilized with stearates of calcium and zinc is suitable for storage of vegetable oil, vinegar and particulate food products. References 4 Russian.

USSR

UDC 678.7:541.697

HYGIENIC CHEMICAL PROPERTIES OF PLASTICS USED IN STOMATOLOGY

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 p 28 manuscript received  
15 Jul 76

BOYKOVA, Z. K., PETROVA, L. I., MAKSIMOVA, N. S., and BROYTMAN, A. YA.,  
deceased

[Abstract] A report on the toxic properties of acrylic resins used in dentistry covers AKR-15, fluorax, noracryl-65, acronil and acryloxide. AKR-15, fluorax and acronil, which are used in dentures, were studied for migration of low-molecular materials over a period of one year. Noracryl-65 and acryloxide, which are used in fillings, were studied for the content of oxidized and brominated substances and aldehydes, including formaldehyde, methyl alcohol and epichlorohydrin. The results of the tests show that these plastics have satisfactory hygienic chemical properties under conditions close to those under which they are normally used in dentistry.

USSR

UDC 678.046.83:541.697

TOXIC PROPERTIES OF SOME ANTISTATICS

Moscow PLASTICHESKIYE MASSY in Russian No 12, 1976 p 27

MIKHAYLETS, I. B.

[Abstract] A report on research to find nontoxic antistatic additives for plastics covers products of hydroxyethylation of higher aliphatic alcohols (alkamon OS-2, oxanol 0-18 and sintanol DS-10) and hydroxyethylated fatty acids (sintamide-5 and diethanolamide of acids of the C<sub>10</sub>-C<sub>16</sub> fraction), as well as dafon and electrostripper EA (a Japanese cationic surfactant). The toxicity of these substances was studied in acute, repeated and chronic experiments on white mice, rats and guinea pigs. The most toxic are dafon and electrostripper EA. Only one antistatic additive, sintamide-5, is nontoxic enough to be recommended for use in plastics that come into contact with foodstuffs or are made into toys.

USSR

UDC 615.214.31.015.4 + 615.214.31.099

THE PHARMACOKINETICS AND TOXICOLOGY OF SYNDOCARB

Moscow KHMIMKO-FARMATSEVTICHESKIY ZHURNAL Vol 10, No 12, Dec 76 pp 70-72

SHUVALOVA, M. YE., LIBERMAN, S. S., and YEGOROVA, YE. F., All-Union Scientific-Research Chemico-Pharmaceutical Institute imeni Ordzhonikidze, Moscow

[Abstract] The pharmacokinetics, toxicity and some of the indices of central action of the new psychostimulant "syndocarb" (developed by the above-mentioned institute) are studied. The drug is easily absorbed in the gastrointestinal tract in the form of powder or tablets. Like phenamine (amphetamine), it intensifies the motor activity of animals, and has a hyperglycemic and hyperthermic action; however, it is much less toxic than phenamine, and has a wider range of therapeutic application. Various tests run during the study show variation in concentration of syndocarb in blood serum, variation in body temperature, variation in blood sugar, and toxicity (the first three items were determined with rabbits as test animals, the last with mice and rats).

Radiation Chemistry

USSR

UDC 542.61:546.791

THE SEPARATION OF URANIUM AND FISSION PRODUCTS BY USE OF A LIQUID EXTRACTION MEMBRANE

Leningrad RADIOKHIMIYA in Russian Vol 18, No 6, 1976 pp 851-857

MOSKVIN, L. N., KRASNOPEROV, V. M., GRIGOR'YEV, G. L., and TSARITSYNA, L. G.

[Abstract] The laws governing the fluxes of uranium through a liquid extraction membrane were determined, using tributyl phosphate attached to an inert porous carrier for purposes of illustration. Factors for the purification of uranium from fission products are determined for solutions of the following composition: 0.5 N  $\text{HNO}_3$  and 6 N  $\text{NH}_4\text{NO}_3 + 0.1$  N  $\text{HNO}_3$ . For the first of these solutions, the purification factors (for uranium from all fission products) are significantly higher than for the second. Regardless of the material of the carrier (porous polytetrafluorethylene, hydrophobized Schott glass filters), the basic characteristics of the dialysis process are preserved.

USSR

UDC 542.61:546.791.6

THE INFLUENCE OF STRUCTURE ON THE EXTRACTIVE CAPACITY OF PHOSPHORIC ACID AMIDES. II. EXTRACTION OF URANYL NITRATE

Leningrad RADIOKHIMIYA in Russian Vol 18, No 6, 1976 pp 848-850

LASKORIN, B. N., BUCHIKHIN, YE. P. and YAKSHIN, V. V.

[Abstract] Determinations were made of the effective extraction constants for uranium (VI) by amides and ester amides of phosphorus which have various structures. It is shown that the introduction of alkylamine substitutes into the molecule of medium esters of the organophosphorus acids produces a significant increase in their extractive capacity.

CSO: 1841

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